

Really Cool Computer Art

4.1

JOURNAL

OF

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COMPUTER

AESTHETICS

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PostScript Now

Still Video

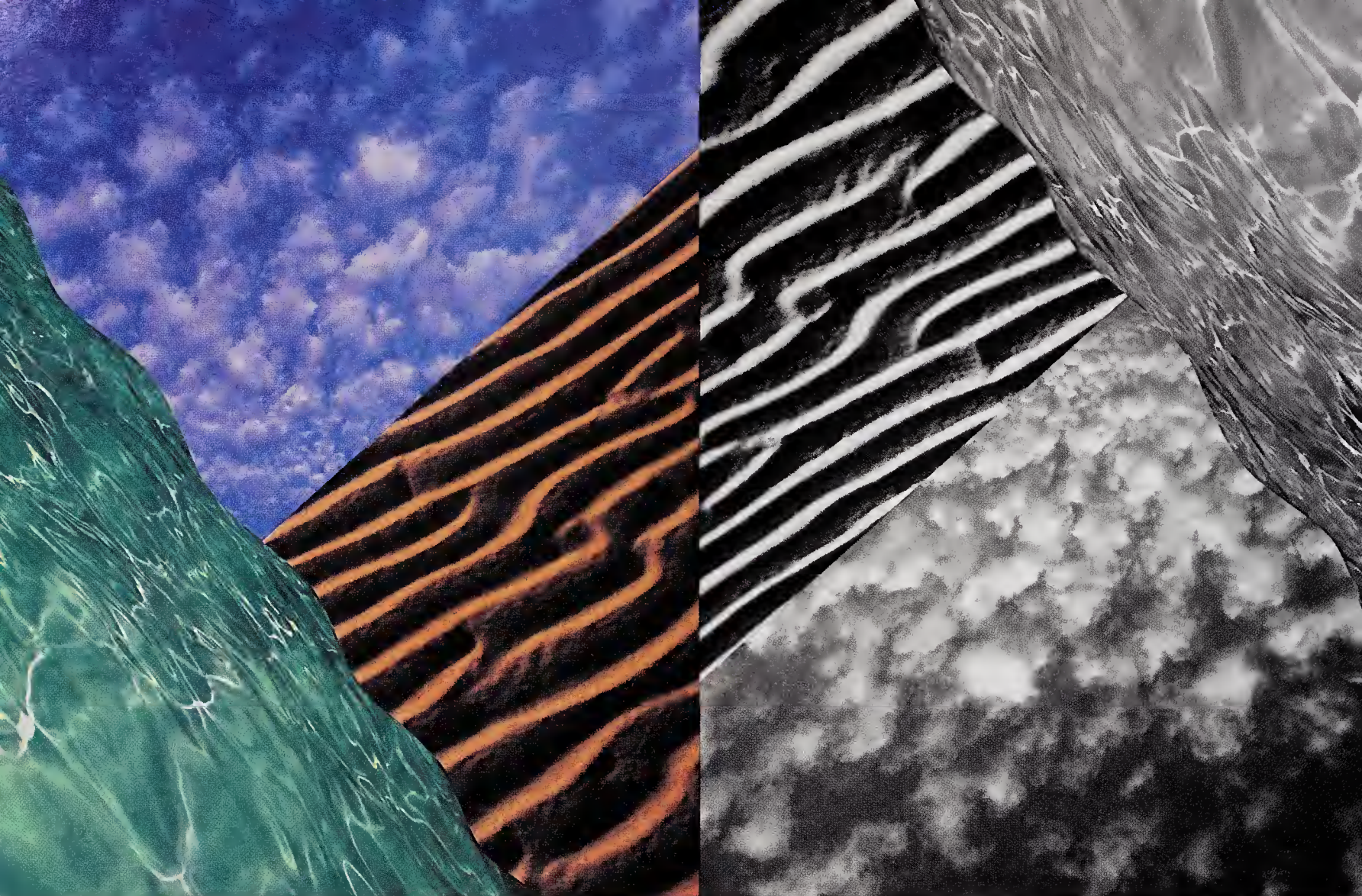
Voice

OCR

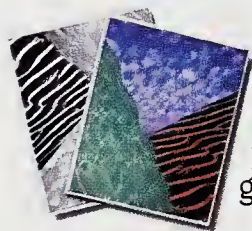


earth gallery

Street Poet Ray



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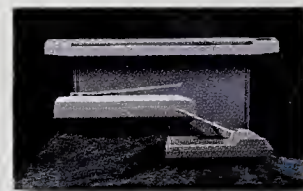
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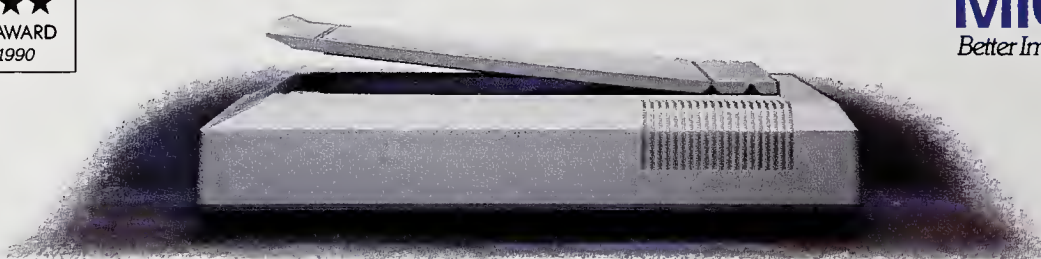
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"Roses Have Horns"

Verbum

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Editorial Submissions

Write to Verbum Editor for a copy of *Verbum's* Editorial Guidelines at the address at top.

Art Submissions

Send creative works with a 100-word explanation of the process used (including hardware and software used) and a 50-word biography, on disk and on paper (Macintosh format preferred, MS Word or MacWrite for text files). If work involves combined media, photostats, photos, or transparencies are welcomed. Please include a self-addressed, stamped envelope for return of the materials. Send to Verbum Art Submissions.

Cover

This issue's cover started with Michael Gosney's concept and a still video shot of Street Poet Ray (see page 29) taken by Jack Davis with a Sony Mavica. The stillvid was converted to digital form using the Advent Neotech board with a Mac II. David Siegel used Adobe PhotoShop to add the textured background, along with Ray's hair and tie. Jack then added textures, including type, to Ray's shirt and electrified the pencil. Following John Odam's design, Jack executed the chiseled type treatment for the masthead. The 1800k, 24-bit Adobe Photoshop file was then placed in a PageMaker 3.02CE file, where John added the type treatments, including the "Earth Gallery" graphic. The page was color separated through a Scitex/Visionary system.

Frontispiece

The "Roses Have Horns" illustration was created by Don Baker using Freehand 2.0. The type, added to the PageMaker page, was set in the new Adobe font Tekton developed by David Siegel, and given the curved baseline using the Emerald City Software TypeAlign program.

Production Notes

Issue 4.1 was produced with PageMaker 3.02CE on Macintosh II, IIfx and IICI machines. The color pages (except ads and page 16) were output on a Scitex system by Precision Litho of San Marcos, California. All text and spot color graphics were converted to Scitex format using Scitex V.I.P. (Visionary Interpreter for PostScript) software. Adobe PhotoShop was used to separate color graphics (PICT2 and 24-bit color TIFF files), which were then merged electronically on the Scitex Assembler workstation with the converted pages. The one-color pages were output on a Linetronic L-300 by Central Graphics of San Diego as film negatives at 2540 dpi. Central also output color page 16, including the placed FreeHand graphic, using Adobe Separator.

Still video photos were converted to black-and-white TIFF files on pages 3-5. The marble background for the New Frontier Products pages and "COOL" treatment on page 43 were rendered in StrataVision 3D. *Verbum* 4.1 was printed on 60# Northwest and 100# Warrentlo (cover) by Pendell Printing of Midland, Michigan.

3 Intro by Michael Gosney

6 Look and Feel by Linnea Dayton

"Photo Synthesis" explores photo manipulation past and present, focusing on the effects of electronic photography in journalism and advertising.

9 Earth Gallery

A selection of digital art with an emphasis on the natural world, with works from Bob Woods, Kunio Miyairi, Greg Vander Houwen, Mike Gilmor, Elizabeth Lawhead, Deborah Ivanoff, Richard Cordero and Steven Goehring, Don Woo, Victor Lafica, Mark Paglietti and David Herrold.

16 W(h)ither PostScript by Steve Roth

The expert's expert Steve Roth (former editor of *Personal Publishing* magazine and author of *Real World PostScript*), gives us a definitive report on the current state of PostScript.

20 Against the Grain by Steve Hannaford

"Fonts in Conflict" brings us up to date on the current industry changes affecting the world of digital fonts.

22 OCR by Mike Kelly

Optical character recognition has come of age, and Mike Kelly serves up a full report.

24 The Interlocution Solution by Christopher Yavelow

Voice recognition on pcs for musicians and artists by renowned MIDI expert, composer, creative hacker-reporter Yavelow.

28 Type Gallery

Tom Gould shares his limerick play, and treats rap-haiku from Street Poet Ray.

30 NeoMedia by David C. Traub

"What's in a Word?" explores new media terminology.

34 First Contact by John Odam

Art director Odam renders 3D type and effects with StrataVision 3D and various PostScript graphics programs.

36 Oh, George! Where Has All the Film Gone? by George Seibt

One of the top still video experts in the newspaper industry gives us the rundown on this exciting new technology. Verbum's editors have also added a gallery of creative still video work and key still video product highlights.

43 New Frontier Products by Mike Kelly

A great assortment of exciting new products kicks off the '90s, including many notable type-related products.

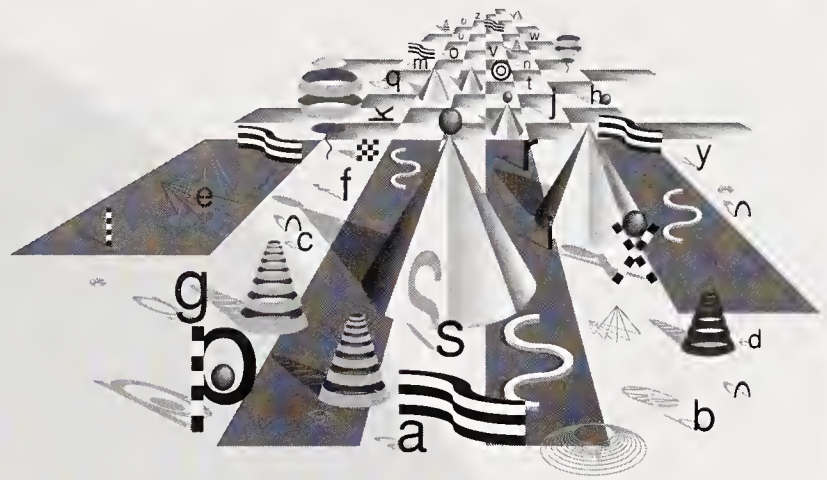
53 If 6 Wuz 9

The first installment of a new *Verbum* comic strip by Mike Swartzbeck.

54 Verbumalia

A new section featuring *Verbum* back issues and products, as well as a few selected products from other sources.





COROTHY REMINGTON

Time to write the Intro. No computer at home tonight. Hey, a yellow pencil. And a yellow pad. This is great! Words on paper. What a feeling. I'll have to tell Douglas Adams about this . . .

Welcome to *Verbum*, circa. 1990. Issue 4.1, following last year's Word concept issue, focuses on written communications in the context of personal computer art. We also follow two other themes here: still video and Earth art.

Steve Hannaford's "Against the Grain" treats the complex issue of competing font standards. John Odam experiments with 3D type on the Mac II in "First Contact." David Traub grapples with terminology for new technology in "Neomedia." Linnea Dayton's "Look and Feel" explores ethics and photography in light of the new digital photography tools. And "New Frontier Products," edited by Mike Kelly, provides a wealth of news, with an emphasis on word-related products.

Features include an overview of the new realm of still video by technical expert John Seibt: "Oh, George! Where Has All the Film Gone?" The article includes some stimulating examples of creative digitized imaging. Mike Kelly reports on the state-of-the-tech of optical character recognition in "OCR Comes of Age." Complementing this, MIDI master Christopher Yavelow gives us the run-down on *voice* recognition in "The Interlocution Solution." And finally, we're pleased to have desktop publishing savant Steve Roth with us, who provides a definitive exposition on the ever-unfolding world of the PostScript page-description language.

This issue has two galleries, one focusing on writing and typography, the other in celebration of the anniversary of Earth Day, on the natural world. Lastly, check out "Verbumalia," where we hawk a bunch of, to use Jack Davis's favorite term, "Cool Stuff . . ."

Verbum News

We've relocated to new quarters in San Diego's downtown arts district. We're on the second floor of the historic Pannikin building, headquarters of a coffee importer and café operator, much loved in these parts (when they roast downstairs on Mondays, the aroma pervades). In mid-summer, we'll open the Verbum Gallery here, and join the handful of galleries around the world specializing in pc-assisted fine art.

This issue represents a step forward, with a 40,000-copy, perfect-bound print run. We hope you enjoy it, and pass "the word" on. Please write and tell us what you would like to see in these pages, and let us know if you've a friend who should see a sample copy. We'll be happy to send it out.

The Verbum book series is off the ground with the first two titles, *The Verbum Book of PostScript Illustration* and *The Verbum Book of Electronic Page Design* (see "Verbumalia," page 54).

Industry

Seems like high tide on the corporate plain in our industry. Silicon Beach (our local pals) bought by Aldus. Emerald City Software bought by Adobe. Apple under fire ("What about *the rest of us*?"). Farallon and Macromind doing Windows. Wow.

And there's an avalanche of advanced new products. Color galore. Printers. 24 bits. Video compression. 3D rendering and animation. Still video. The Voice Navigator.

Not only are the electronic art tools evolving quicker than we thought possible, but general pc innovations continue to astound. For instance, Sony just launched PalmTop PCT-500, a 2.8-pound, book-size computer with a screen size and resolution matching the Mac. It has a 16-bit processor and 320K of built-in RAM. It's interface is icon-driven, very intuitive, and it can be controlled by either a panel that moves the cursor, or a light pen. But its most amazing feature is its ability to recognize written commands. Users can write on the screen with the light pen, and the system, using "fuzzy logic" programming, can identify English letters and more than 3500 Japanese characters. Or how about Boston-based Reflection Technologies' Private Eye — a 720 x 280-pixel display that's "projected" from a 2x1x1-inch box mounted on a headband. Advanced optics gives the impression of text and graphics floating in the air about 2 feet in front of a user's eyes, for hands-free and portable computer use.

It's the '90s all right. This must be the future we imagined in '85. Has it come a few years early or what?

On the Road

I've found myself travelling a bit lately, witness to some rather interesting events:

Tokyo I'm still assimilating our trip to Tokyo last September (see the "Imagine Tokyo '89" article in issue 3.4). Jack Davis, Barbara Thurlow and I were fortunate to have had thoughtful hosts, Izuru Satsuki, Madoka Aikawa and Kuro Takahashi of Holonet, who made

sure our two-week visit was complete. We saw a great deal of Tokyo, and visited the Buddhist temples in Kamakura. We had a terrific response to the Imagine pc art exhibit there, our most ambitious show yet.

SEE HYPERNOTE 1
JAPAN

Digital '90 We contributed digitized image artwork to an exhibit at the recent Digital '90 Photography Conference in Washington, D.C. Sponsored by *USA Today* and the National Press Photographers Association, this was an impressive event, showcasing the latest in quickly maturing still video technology. Sony has the edge in the high-end newspaper market, and they unveiled their latest total system of highband cameras, digitizers, printers and telecommunications peripherals. Canon is the second strongest marketer, with more focus on the desktop publishing and design market. They have been working with Mac and IBM third-party suppliers of digitizers and are introducing a player/digitizer of their own that plugs directly into the Mac SCSI port. Canon color laser copiers output beautiful still video prints (and thumbnail proofsheets). The jury is still out on the electronic design market acceptance of these color video digitizing products, but we think they merit serious exploration, hence the attention paid to the subject in this issue.

A nice bonus for Digital '90 attendees was the just-opened Tech 2000 Gallery of Interactive Media, located in the same hotel complex as the show. I wandered in unprepared. Developed by the Interactive Video Industry Association, with over \$2,000,000 in donated equipment and programs, this fantastic facility

includes over 70 exhibits of multimedia works. We'll have more on this in the next issue of *Verbum*.

TED2 Well, the "ideal dinner party" dreamed up by information industry/design visionaries Richard Saul Wurman (author of the insightful guidebook *Information Anxiety*) and Harry Marks (influential broadcast designer) was a successful if difficult-to-assess event. The second Technology Entertainment Design

conference, limited to 500 participants, was held February 22-25 in Monterey, California. The \$695 fee entitled the lucky registrant to three days of presentations from a roster of heavies, including Bob Abel, Douglas Adams, Bill Atkinson, Herbie Hancock, Nigel Holmes, Takenobu Igarashi, Alan Kay, Jaron Lanier, John Naisbett, Nicholas Negroponte, Ted Nelson and John Sculley. Just as interesting were the attendees, including recording artists Graham Nash and Kenny



Rick Smolan and Tom Reilly: TED2 dudes

Rankin; noted computer industry journalists such as Stewart Alsop, Denise Caruso and Daniel Farber; CEOs like Trip Hawkins of

Electronic Arts; television and motion picture producers; venture capitalists; a bevy of Apple managers; publishers Eric Utne of the *Utne Reader* and Louis Rossetto of *Electric Word* (see "New Frontier Products"), as well as editors from *Popular Science* and other mainstream books; and an impressive lot of influential designers, software engineers and neomedia instigators. (Jack Davis and I were there with an exhibit of works from the Imagine show, and a demo of *Verbum Interactive*, the CD magazine we're developing.)

HYPERNOTE 1 JAPAN

High Technology in the Service of Spirit?

Looking at Japan from the point of view of a U.S. businessperson concerned about the trade deficit and equipped with the somewhat unsettling book *The Enigma of Japanese Power* by Karel Von Wolferen (Knopf, 1989), a visit to Tokyo can feel like a trip into the belly of the beast. This is the awesome city-civilization bound and driven by an intense genetic web of singularly Japanese associations, a Family that has convoluted for centuries in unique isolation, with a historic inclination toward rather off-putting if not aggressive behavior toward foreigners. Their carefully planned and maintained government/industry collusion for success (dominance?) in international trade has methodically brought one U.S. industry after another to its knees. Japan has used the "free trade" structure of the West to its own advantage with strategic protectionism and government-assisted research and start-up programs for companies and products aimed at targeted industries. And probably the most significant edge the U.S. has had—the advanced semiconductor industry—is on the verge of being lost to Japan within the next few years. We will then depend on Japanese suppliers for the underpinnings of any high-tech product innovations—the chips. And as in any Family, secrets are shared: Japanese manufacturers have inside access to new chip designs, giving them at least a six month lead on new product development. Kind of scary, this vision of a little island nation that seems a modern day Roman empire on the rise.

On the other hand, a visit to Tokyo, from a more aesthetic and spiritual viewpoint, is a chance to experience an elegant, highly-refined civilization that seems very rooted in the organic world, and attuned to the subtle moments of life. People don't steal. Traditions are sacred. Everyone's in step. It's a city of millions: four-story buildings bunched side by side, street after street, block after block, mile after mile. But there is an order, an aesthetic sense, a feeling of calm unity. It was when I stood before an awe-inspiring temple in

Kamakura, meditating on the distinct Spirit of the Japanese race, that a thought boomed in my mind: *high technology in the service of spirit*.

Our experiences with our Japanese friends and associates have almost always been very positive. One evening I enjoyed a late-night meal with two movers and shakers in Japan's pcartworld: Yuko Hayakawa, editor of *Bug News* magazine (on dtp), and Yuuchi Inomata, publisher of *MDN* (Macintosh Design Network) magazine. Incredible food, special cold saki, and cigarettes (they almost got a California non smoker going). We quickly left dtp and electronic art behind to grapple with more sweeping subjects such as the fact that Japan never really had its '60s . . . Jack Davis and I visited Akihabara, the electronics district, where near-department store-sized buildings offer miles of aisles of every conceivable Walkman variation, not to



Ice Bowl from Daikon-Ya restaurant

mention desktop dish-washers and laptop pcs. Jack noticed a laptop with color prints of scanned images taped to it. On closer inspection, it had a Sharp JX-100 24-bit scanner attached. And a color dot matrix printer built into the back. Price in U.S. dollars for the whole set up: \$850. And in designer black, yet. We visited cafés, bookstores, the must-see Roppongi (bars and restaurants and thousands out after 2:00 a.m., not boring),

Ginza (Tokyo's elite shopping area, boring) and Asakusa districts, and more. Satsuki took us to dinner at Daikon-ya, an amazing restaurant where we enjoyed a 12-course meal, each dish a sculptural presentation of food items, small statues, baskets, flowers, stones, and so on. The many tastes and textures, perhaps enhanced by my near-

complete unfamiliarity with them, were each distinctly delightful.

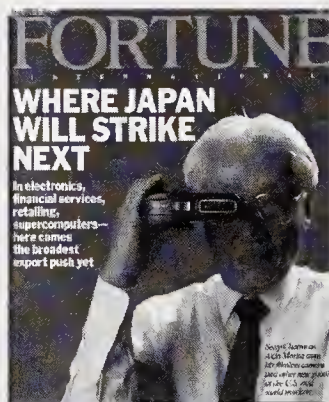
Satsuki-san and Madoka-san did a great job of integrating IMAGINE TOKYO '89 into the higher levels of the Japanese art world, involving well-known artists from other fields.

The Sogetsu Gallery, in the Sogetsu Kaikan School of Ikebana (flower arranging) seems to be known to every Japanese person I've mentioned it to. Flower arranging, an honored artistic tradition, has reached a modern zenith at Sogetsu, Japan's most avant-garde school.

In general, we found that people seemed much more attuned to the idea of pc art in Japan than in the U.S. The exhibit was featured in consumer magazines and on a TV show called "Catch Up!" (about the latest trends, with cute young women talking excitedly about the hottest new nightclub or happening). Of course, Japanese culture thrives on trends, and there is an excitement about the future, reminiscent of the U.S. in the '50s, I suppose. They are a high-tech society, yet with traditional ways and icons preserved alongside imported styles and images. Women are still second to men socially. Yet women managers are on the rise in the business world. Interestingly, housewives represent one of the largest groups of telecommunicators—learning, communicating and working on-line from home—according to Kuro Takahashi, one of our Holonet hosts, and also Japan's elder guru on pc telecommunications. But beyond their receptivity to the new and the novel, the Japanese have an incredible design sense. And be assured that even though Japanese artists have until last year had limited access to the Macintosh (due to the high cost and lack of Kanji fonts) their innovative uses of electronic art tools are easily on a par with work being done in the U.S. and Europe.

Japan... yes, an enigma. But a rich and wonderful one, full of paradox and promise. For all the fear and frustration with Japan, I wonder, what would we have done without them?

— MG



FORTUNE WHERE JAPAN WILL STRIKE NEXT

In electronics, financial services, retailing, supercomputers—here comes the biggest export push yet



From *Verbum Interactive*

The idea was that the presentations and the synergy among the attendees (facilitated by a master HyperCard stack that included vital information on each) would bring about breakthroughs in the realization of The New Media. Kind of like biologist Ilya Prigogine's theory of dissipative structures: if you get the right elements together, things will kind of rock and roll, appear to almost break down, and then Eureka!—a new level of complexity clicks in. Well, as far as I can tell, it didn't quite happen like that, but there will likely be plenty of residual effect from the excellent networking facilitated by the event. If anything, the undercurrent of environmental concern was the most noticable theme to emerge. Pretty encouraging: nerds care too.

TED3 is slated for February 21-24, 1992. Plan now, if you think you can deal with it (TED Conferences, Inc., 619-259-5110).

SEE HYPERNOTE 2 TED2

CD-ROM The Fifth International CD-ROM Conference and Exposition was held February 27-March 1 in San Francisco. Though I couldn't attend the seminars, a survey of the trade show floor and attendance at a few general sessions provided some exciting insights. CD-ROM finally seems to be poised for market reality.

The fourth general session moderated by Stewart Alsop brought top dogs from Microsoft, IBM, Sony, Headstart (the booming pc-clone maker who beat others to market with a pc with built-in CD-ROM drive) and Apple. The panel's discussion centered on platforms for CD-ROM and built-in multime-

dia capabilities for pcs. After much discussion about what everyone was going to do, Tyler Peppel from Apple demonstrated new Macintosh system software capabilities: launching a document from PowerPoint, "a presentation program from one of our more successful software developers," Peppel proceeded to open the "video browser" window from the Apple menu, which contained four 5-second full motion digital video clips, all running in loops. After moving each clip into the

presentation window, he clicked on one, enlarging it to full size and revealing the soundtrack. Also, enjoying the drama, quickly asked the IBM chief and the others what they thought. The consensus was that that's what we need, all right. The moment was a good one for Apple, as was the response to the announcement of a price reduction for the company's CD-ROM drive.

During another general session, Toshi Doi, head of Sony's Super Micro Systems group, held up a CD "Walkman" with a built-in player

and keyboard that he said was developed two years ago, but has still not been brought to market. Noting that it was outdated technology in some significant ways, and that Sony would have to sell 100,000 units at \$700 retail to succeed, he polled the audience by a show of hands. The "nays" won by a fairly clear majority.

CDI, or Compact Disc Interactive, was demonstrated at the Phillips/Polygram-owned American Interactive Media booth. Although the consumer launch for

this watershed product is set for late 1991, we saw some exciting programming examples, including an interactive version of Sesame Street.

Major players in the pc and media industries are now fully aligned with CD-ROM as a publishing medium. It's going to be hot.

That's about all for now. We'll pick up the multimedia design theme next issue (see page 53).

Keep in touch!

—Michael Gosney

HYPERNOTE 2 TED2

Pursuing the Holy Grail of Converging Media

TED2 was criticized by attendees as being a bit too elite, out of touch with the real world, too damn cool. But what did the critics expect? Jazz singer Kenny Rankin, who observed that he and his wife "felt like the Flintstones attending the Jetsons reunion," had a hard time relating to much of the technobabble. He and Aime gave a presentation on the history of music as communication, which consisted mostly of Kenny singing love songs to his new bride. Way to go, Flintstones!

At TED2 press folks weren't allowed, unless they paid for a ticket like everyone else, and commercial exhibits were limited to the few really "in" companies like Adobe, Letraset and Apple, who each had breakout rooms with ongoing hands-on demos. Apple's room was really just a bunch of Macs, souped up with dtp and multimedia stuff. (Someone brought in a lonely NeXT machine that hardly anyone had patience for; perhaps, after a couple of years of evolution, it will make a showing at TED3) There were Mac SE's, accessing the HyperCard conference directory, positioned around the periphery of the large lobby where networking-over-coffee ensued at each break between presentations in the modernistic auditorium. Also in the area were videos of cutting-edge computer animations, and *Verbum Interactive*—a demo of our multimedia CD magazine, or hypermagazine, or whatever it is. Built in Macromind 2.0 and running on a 5 MB Mac IIcx, it incorporates some great design ideas and innovative interactivity, including talking agents and lots of 3D animation. Other attractions included the Virtual Reality room, where one could test drive a synthetic reality, using VPL Research's DataGlove and dual-CRT goggles (connected to half-a-million dollars worth of 01-crunchers); a bookstore and resource center; and Sony's HDTV theater.

Some high points of TED2:

- Jaron Lanier, CEO of VPL Research, the lovable, dreadlocked *wunderkind* of virtual

reality, gave a very warm presentation on his new field, imparting Jaronisms such as "If you program someone's reality, they throw up" (referring to the seasickness problem that occurs when people experience a virtual scene through the CRT goggles that doesn't properly correlate with their own body movements).

• Scientist/designer Payson Stevens' presentation of "Earth: Vital Signs." This HyperCard-based multimedia presentation was developed for Robert Redford's Sundance Institute Greenhouse/Glasnost symposium

on global warming. It brought an emotional response from the crowd (standing ovation with tears), both because it so poignantly illustrated the power of these presentation tools when used by a team of talented artists, and because it conveyed meaningful content: *real reality*.

• Computer animation legend Robert Abel demonstrated his Mac II-based interactive treatment of "Guernica," Picasso's highly symbolic painting, accessing text, voice, photos and full-motion video by clicking on the painting different parts. Equally impressive was his hypermedia version of Alfred Lord Tennyson's poem *Ulysses*, on an IBM PS/2 system. With imagination, aesthetic sensitivity and craftsmanship, interactive multimedia can be truly revolutionary, as the work of Abel's group demonstrated. Great content, of course, makes a big difference too.

• Ted Nelson, developer of the Xanadu be-all/end-all system of global communications and data management (now under the Autodesk umbrella), and originator of the terms "hypertext" and "hypermedia," jolted the TED crowd out of their self-absorbed glaze by ranting and raving for 45 minutes on our lousy pc interfaces (including the Mac), our pathetic networks, and how basically full of it we all are. (Ted seems quite skilled at criticizing, but by jove, you have to admit he's been on to something this last 20 years...) He concluded with a passionate message for cleaning up the mess we've made of Planet Earth.

• Douglas Adams, author of the Monty Python-ish sci-fi spoof *The Hitchhiker's Guide to the Galaxy* series, recounted his creative experiences with the Mac. I particularly enjoyed meeting him, as my first "interactive fiction" experience was Mindscape's version of *Hitchhiker*, extremely clever, and just a tad hilarious (from there I finally read the books, which had been needling me from bookstore shelves for years). Recently, I received a hardcover review copy of his latest book from the PR firm for the publisher of FullWrite Professional, the word processing program he used in writing it. What an angle.

• Bill Atkinson, creator of MacPaint and Hypercard, demonstrated a teacher's technique for teaching number values to small children. He has been teaching kids himself, and considering new ways to use computers in education. He noted that computers have a very long way to go for many teaching applications.

• Brad deGraf and Michael Wahrman were noteworthy for two things: first, their incredible digital puppet, a real-time, 3D synthetic agent, projected on the stage screen in the form of a 15-foot Harry Marks face, reacting to the real Harry as he spoke from the podium, and second, the deGraf/Wahrman business card's flip side slogan: "Young, Fast and Scientific."

• Eco-awareness was a theme that seemed to surface repeatedly at TED2. Payson Stevens, Ted Nelson and Nigel Holmes (art director of *Time* magazine) brought the subject into their presentations. Eric Utne (publisher of the *Utne Reader*) held an impromptu "Utne Salon" dinner for people in the media to explore answers to the question "what is the role of the media in shaping a sustainable culture?" The 40-person contingent, crowded into a small Thai restaurant in Cannery Row, included a load of info-industry editors. One

result of the event: philanthropist Joshua Mailman proposed a conference on the environment for people in technology fields, tentatively dubbed "EcoTech." I had an experience that fit the eco theme: while waiting in line to enter virtual reality, I met Jon Jerde, designer of San Diego's groundbreaking urban redevelopment project, Horton Plaza. I expressed my enthusiasm for the stunning, convoluted three-dimensional complex and mentioned that I thought it was a step toward Paolo Soleri's vision of aesthetically stimulating and ecologically designed city complexes. He affirmed that he had in fact worked under Soleri, and that he was currently developing two projects in foreign countries that include the ecological ideas. As a friend and supporter of Soleri's work, I feel urban design is the most overlooked major issue in building our sustainable future. It's exciting to hear about his ideas finally being realized.

• Under the direction of *A Day in the Life* photo book series producer Rick Smolan, photographers captured the four days of TED2 using Sony ProMavica still video cameras, and Video 8 recorders. On the last day, a multimedia presentation, with an original soundtrack by MIDI-expert/composer Jeff Rona, was played. "A Day in the Life of TED2," like the event itself, was really quite good, but could have been, somehow, even better...



deGraf/Wahrman business card

TED2 symbolized the pregnant convergence of high technology, entertainment (a consensus emerged that the "E" also means Education) and art. The event helped crystallize the movement. It's a vision quest. And it's just going to get more exciting. Check with you at TED3!

—MG

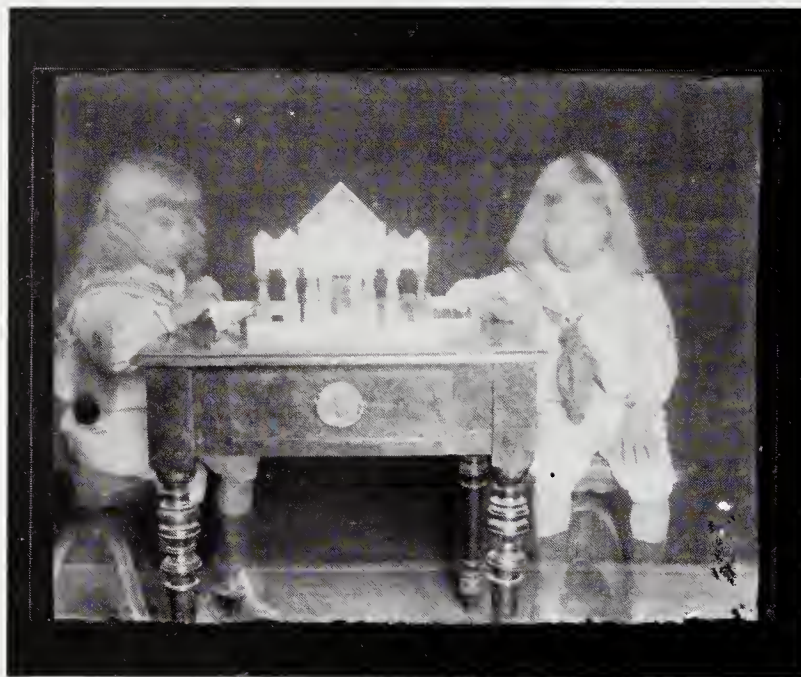
In a world where medical doctors can edit out a diseased heart or liver and replace it with a healthy one, where 41-year-old Hank Williams, Jr. can edit himself into a recording of his 29-year-old father singing and playing "There's a Tear in My Beer" on a tape made shortly before the death of the elder Williams in 1953, the editing of photographs made possible by digital manipulation seems like just another take-it-for-granted miracle. Since the beginning of photography, photographs have been manipulated, so in a sense editing pictures is nothing new (see "Image Editing Then and Now" on page 7), although some established fine art photographers are probably irked by the ease with which photo manipulations can now be performed by anyone with a microcomputer and a few hundred dollars' worth of software (and without years of training, perfecting darkroom techniques and accumulating the appropriate equipment). Certainly electronic photography, especially the instant-play photos made possible by still video, and image editing are wonderful contributions to photography as a fine art medium. They provide an opportunity for artists to create fantastic realities that can help a viewer's imagination take flight.

But if we look at the societal changes that are already being brought about by scanning, still video, frame grabbing and other forms of digitized imaging, and that will be proliferated many fold in the future, we can detect some hard-to-resolve questions marching along with us as we move toward a look of greater realism in synthesized images — questions that have always been there, perhaps, throughout the history of photography.

A Brief Look at History

Photography originated as an attempt to record reality, to produce an image as much like a subject's real-life appearance as possible, to replace the *camera obscura*, a sketching aid developed in the 1500s that projected upside-down images onto a screen or a piece of paper by allowing light from the subject to pass through a small hole. Like all cameras since, even the *camera obscura* distorted reality somewhat by taking a piece of a larger scene out of its context.

Photo Synthesis



A GLASS-NEGATIVE DOUBLE EXPOSURE FROM THE EARLY 1900S, PHOTOGRAPHER UNKNOWN

It was inconvenient for sketchers to have to depend on the *camera obscura*, early versions of which were closet-size — not easy to move from place to place; a method was needed to record the camera's image permanently so the artist could carry the "subject" around and sketch anywhere. During the 1830's, Louis Daguerre, a French inventor, originated a way to expose a sheet of silver-coated copper, develop it with mercury vapor and then fix it with table salt. With the daguerrotype, because several seconds were required to expose the plate, shots had to be carefully set up and motion frozen during the exposure, another compromise of the "truth."

The same year Daguerre patented his process (1839), William H. Fox Talbot in England announced his invention of light-sensitive coated paper for producing a negative from which positive prints could be made, many prints from one exposure. As soon as printed photographs existed, the prints could be altered, and so they were (see "Image Editing Then and Now" on page 7). Portrait photographs were hand-colored, and retouched with pencils and opaquing materials to suit the vanity of the subject. Often the retoucher was paid more than the photographer.

The invention of the collodion-coated glass plate in 1851 by British photographer Frederick S. Archer

greatly reduced exposure time and improved print quality. By now photography had come into its own as a medium for recording real-life images, not just as a sketching aid. But the photographic plate was wet, and the pictures had to be processed as soon as they were taken. That meant that the darkroom had to go with the camera, and the photographer still wasn't recording much spontaneous activity.

In 1871 British physician Richard L. Maddox created a dry plate, using a gelatin emulsion, and gave photographers greater mobility and freedom. It also allowed projection printing, which meant that there no longer had to be a one-to-one size correspondence between negative and print. Enlarged prints could be made from a negative, and that revolutionized photography. Besides allowing smaller cameras, the projection printing let the photographer's hand control the image at the printing stage. Negatives could be combined to put clouds into clear skies, for example, and dodging or burning could lighten or darken parts of pictures.

Cameras became smaller and cheaper, and in 1888 George Eastman introduced the Kodak box camera. A roll of film for the camera took 100 exposures and cost a month's wages to

process. But these little cameras soon took photography by storm. Cameras were made small enough to hide, and people could be photographed unaware. Pictures were taken quickly and there was no longer a ritual between sitter and photographer. While serious photographers stuck with large cameras, snapshot cameras intruded into people's private lives. The camera became so offensive for a while, that some places had laws that prohibited photographing in public.

Photojournalism grew up with the camera and developed its own ethical standards. In the late 1800s large numbers of fraudulent photos were produced. In the Crimean War and the U.S. Civil War, photographers dragged the bodies of fallen soldiers into some of their pictures for greater visual impact. Grossly faked pictures were used for sensationalist and propagandistic purposes during the Boer War and into the first decade of this century.

At the same time, in artistic photography the Pictorialists explored techniques, materials and effects of manipulation, perhaps in part as a reaction against the snapshot. As might have been expected, concern with realism emerged, and after about 1914 the pendulum swung back to straight photography almost to the exclusion of other forms for many years.

And then came photography in advertising — and all its societal spin-offs — until today as Bill Moyers says, "The mass producing and consuming of images has transformed the way you and I see and understand the world. In politics, in business, in journalism the visual media have taken center stage, shaping the public mind with powerful tools of fiction that both please and deceive. Dramatic visual effects, synthetic dreams, counterfeit emotions, preconceived spontaneity. Public life is a media show."

Photography Today

Photographs still *look* like truth, but they're definitely beginning to *feel* more and more like fiction. The thinking of photojournalists, legislators and the public at large hasn't caught up with what's going on now in digital photography and with the enormous proliferation of photo manipulation we're likely to see in the near future. Photo historian Bill Jay of Arizona State University thinks that the still video camera is likely to have an impact on society equivalent to the invention of

photography in the first place and later the invention of box cameras and roll film. It isn't hard to agree with that prediction. With an electronic image, there is no negative, no permanent historical record of what the reality was at the instant the picture was snapped. If the image is electronically manipulated (*enhanced* is the trade show euphemism we're hearing more of these days), the editor often leaves no footprint to indicate that he or she has been there, no fingerprint for identification.

In two journal articles¹, Elmo Sapwater and Kim Wood do an excellent job of raising just a few of the issues that will have to be addressed with regard to digital photography, and suggesting some solutions. What about copyright? What about the photograph as legal evidence? What about the rights of photographic models? What about the ethics of photojournalism?

Copyright

Current copyright law provides legal protection to the creator of an "original work" until 50 years after the creator's death — the exclusive right to copy and to prevent other people from making copies; the right to reproduce, distribute, display and prepare derivative works based on the original. Unless he or she assigns the right to another, the original copyright owner of a photograph has exclusive rights to works derived from the original by any technology, present or developed in the future. There is a need for contract language that anticipates photo manipulation and deals with it specifically.

Models

Models, who are often paid by the sitting rather than by the use of the photo, may not need to do as much sitting if several images can be generated by manipulating the results of one sitting. Current technology calls for new kinds of contracts among models, photographers and publishers, contracts that specifically address uses of manipulated photos.

Ethics

Both Sapwater and Wood and John Long in "Fakes, Frauds and Phonies" in *News Photographer* (November 1989)

Continued on page 53

Image Editing Then & Now

As we begin in earnest to tackle the aesthetic and ethical questions generated by electronic manipulation of photos, we're reminded that perhaps nothing is new under the sun.

"In the shop window of a certain firm in Regent Street, London, is (or was a few days ago) to be seen a sort of tray containing about a dozen or more small photographs, known as *cartes de visite*, all bearing the likeness, so far as the head is concerned, of a certain noted dissenting minister, but having in some instances appended thereto the body of a gorilla, placed in an attitude commonly assumed by members of the Simian tribe; and, as if to add to the scurrility, these were all labelled — 'The Rev. C. H. Gorilla.' . . . Surely there must be some simple remedy for such gross impertinence." — *from "An Abuse of Photography," an editorial in The British Journal of Photography, 1861.*

"Much has been said and written at various times against the practice of retouching upon the negative, which has now become so general. On its first introduction it was greeted with the condemnation that it was not photography, which is as unanswerable as Mr. Podsnap's condemnation of anything as being 'un-English,' but open to the same question as to whether the fact of its being English (or photographic) stamps it at once as being incapable of improvement." — *George Croughton, in "Photographic Versus Literal Truth" in The British Journal of Photography, 1872.*

"The casual onlooker cannot but be impressed with the wonderful power and the refined discrimination shown by the sensitised emulsion which was capable of recognising and seizing hold of so captivating an effect as is portrayed. But, alas for the fallacy of first-sight impressions! On making a

closer but yet cursory inspection, it will be at once seen that nearly all the particular charm which is so attractive is the product of the brush of some clever artist, whose handiwork has completely obliterated a very large percentage of the figure which forms the subject of the composition." — *An unidentified amateur commenting on a portrait of Miss Mary Anderson, hanging in the Pall Mall Exhibition, in "Hands Off! — A Criticism" in The Amateur Photographer, 1890.*

"In itself photography is but a plastic tool in the hands of those who know how to employ it, and it may be made to subserve good or evil." — *J. Thail Taylor, in "Ethics of Photography and Photographers (A Lecture at the London and Provincial Photographic Association)," reprinted in Photography, 1890.*

"The extract from *South Africa*, given in these pages recently re the manufacture in Paris of war photographs to order, is very interesting. Stay-at-home photographers can have but little idea of the very large number of fraudulent photographs that are in existence both at home and abroad." — *Richard Penlake, in "Bogus War and Other Pictures" in a supplement to The British Journal of Photography, 1899.*

"We did not label that simulation as clearly or as quickly as we should have." — *Peter Jennings, anchor on ABC News World News Tonight, in an on-air apology July 24, 1989 for the simulation of Felix Bloch handing over an attaché case to a KGB agent.**

"I don't think your ethics can be any better or worse using electronic methods than they are using the classical methods. Ethics are in the mind. It is not in the tools you use." — *Hal Buell, Associated Press**

"The issue is this: It's extremely difficult to justify simulations on a newscast, identified or not. What's more, World News Tonight was not simulating news, it was simulating an allegation, in effect airing an untruth about an unknown. It was compelling TV. And it was irresponsible TV." — *Howard Rosenberg, Times Post News Service**

**Jennings, Buell and Rosenberg, as quoted by John Long in "President's Message" in News Photographer, 1989.*

"The advertising ethic is that the truth is that which sells. It's the law of the market. If people buy it, it's right. And one of the areas where this has had perhaps the most detrimental effects is in fact in the area of the informational [news and documentary] media." — *Stuart Ewen, Hunter College, City University of New York***

"The mass production of images is a dynamic process that uses art and artists for the creation of boundless illusions in a materialistic world. Any image ever made, sacred or profane, can be produced wholesale and used for any purpose, particularly to sell things." — *Bill Moyers***

"The frightening thing is that it has become clear now that simply recognizing the artificiality of something does not ensure immunity to that thing." — *Mark Crispin Miller, Johns Hopkins University***

***Ewen, Moyers and Miller from "Consuming Images," one of a series of broadcasts called "The Public Mind," aired by Public Affairs Television in November and December of 1989.*

"... I think covers are a sales tool. It's like an ad. ... the cover was going to be the bait for the book, and they'd look inside and find that the inside was very, very different. What was on the cover, in some ways you wanted to get them at least to pick it up in the beginning. ... In shots, there's a completely different criteria in what you want inside and what you want on the cover." — *Rick Smolan, creator of the Day in the Life series of books, commenting on manipulation of the cover photo of one of the books in the series.[†]*

"We felt it moved the picture into an area that we don't want to talk about — that his t-shirt was immaterial to what he was doing. He was not promoting WABC, he was not a part of WABC, it was a promotional t-shirt." — *John Madden, Senior Assistant, National Geographic, commenting on the electronic deletion of the letters 'WABC' from the t-shirt of a man making crack cocaine in a photo that appeared in a January, 1989 story called "Coca — an Ancient Herb Turns Deadly," in National Geographic.[†]*

†Smolan and Madden as quoted by E. Sapwater and Kim Wood in "Copyright and Ethics: In New Age Photography" (see footnote on this page).

¹"Copyright and Ethics: In New Age Photography" and "Observations and Solutions" in *Highkey*, Volume 1, Number 2, Spring 1989. *Highkey* is a University of Arkansas publication.

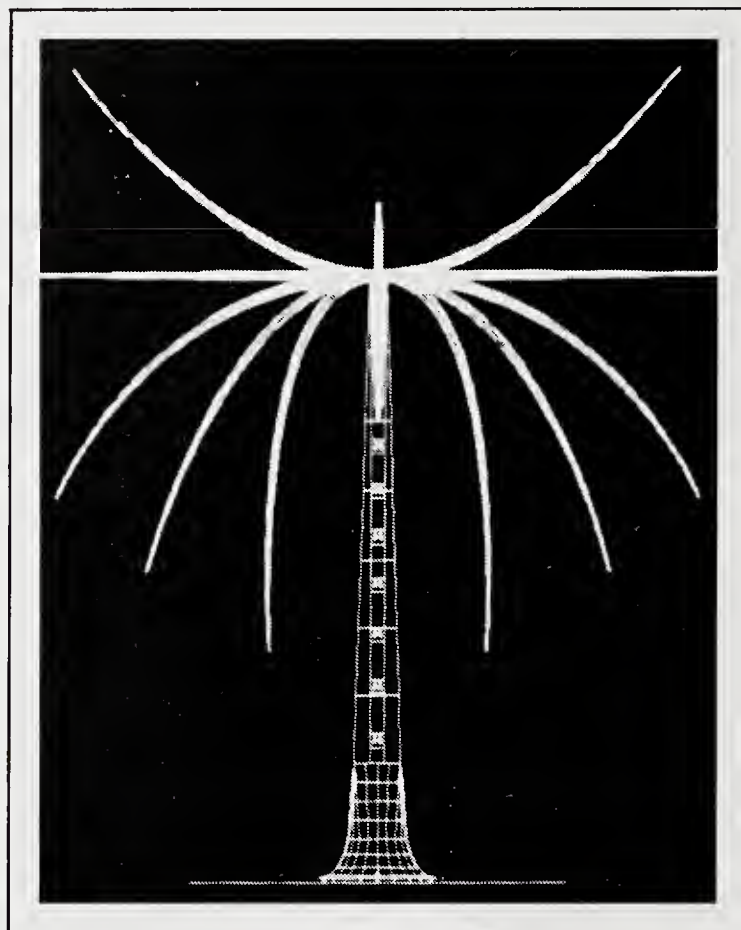
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Jean-Marc Philippe

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Bob Woods

Acid Rainforest

This image was rendered entirely with Studio 8 on the Macintosh II.

Mount Hood

Portland, Oregon artist Woods drew "Mount Hood" originally on an Amiga 1000 using DeluxePaint II, and then ported it over to the Macintosh II (using the GIF file format) for repainting in Studio 8 with 256 colors and the Mac's higher resolution.



Moon Henge

Originally drawn on the Amiga 1000 with DeluxePaint II and DigiPaint, this piece was finished on the Mac II using Studio 8.

Gallery Production Note
Pages 9-14 were separated using the Scitex/Visionary system at Precision Litho of San Marcos, California. As noted in the captions, some images were separated from transparencies and stripped in place. All other images, either color bitmaps (PICT2 files from Mac II painting programs) or PostScript illustrations, were separated as part of the pages by the Visionary software.





Kunio Miyairi

Dandelion

This piece was painted by Tokyo artist Miyairi using Japan's ever-popular NEC PC-9801 and DynaPix V software. The work is reproduced here from a slide of a screen shot.



Greg Vander Houwen

Inverse Symmetry

Mr. Vander Houwen lives in Bellevue, Washington, and has a background in video production and personal computers. This dramatic illustration combines three 24-bit scans of a compact disc, a waterfall, and a piece of stained glass, which were manipulated and combined with Adobe Photoshop. The CD was scanned using a Truvel TZ-3 at 709 dpi, and examined in LaserPaint Color II on the Mac II. The artist's photograph of a waterfall was scanned on a Sharp JX-300 scanner at 300 dpi. Lastly, the image of green and white stained glass was captured on a Howtek Scanmaster at 300 dpi, and used to replace the water in the original waterfall scan, and for clouds, with airbrush enhancements. The sky, one of several elements added using Photoshop's graphics tools, is a radial, graduated fill. The file was output on a LaserGraphics LFR film recorder with a 35mm back to Kodak Ektachrome 100 and enlarged as a Cibachrome print for display. (Separated here from a dupe of the original transparency.)



Mike Gilmor

Nuclear Nightmare
This alarming work was drawn on the Mac II using Studio 8 software. Mike Gilmor is a freelance illustrator based in San Diego and currently living in Tokyo, Japan.



Elizabeth Lawhead

A Wake
To the Kore
These pieces were produced on an NEC 386 pc with a digitizing tablet running Autographix System 3 software. The final artwork was output on a Matrix QCRZ film recorder at 4000-line resolution. The artist reproduces her works for exhibit purposes as 16 x 20-inch archival Cibachrome prints. Based in Oregon City, Oregon, she has exhibited at numerous galleries in the northwest U.S. and Canada. Her works are reproduced here from dupes of the original slides.



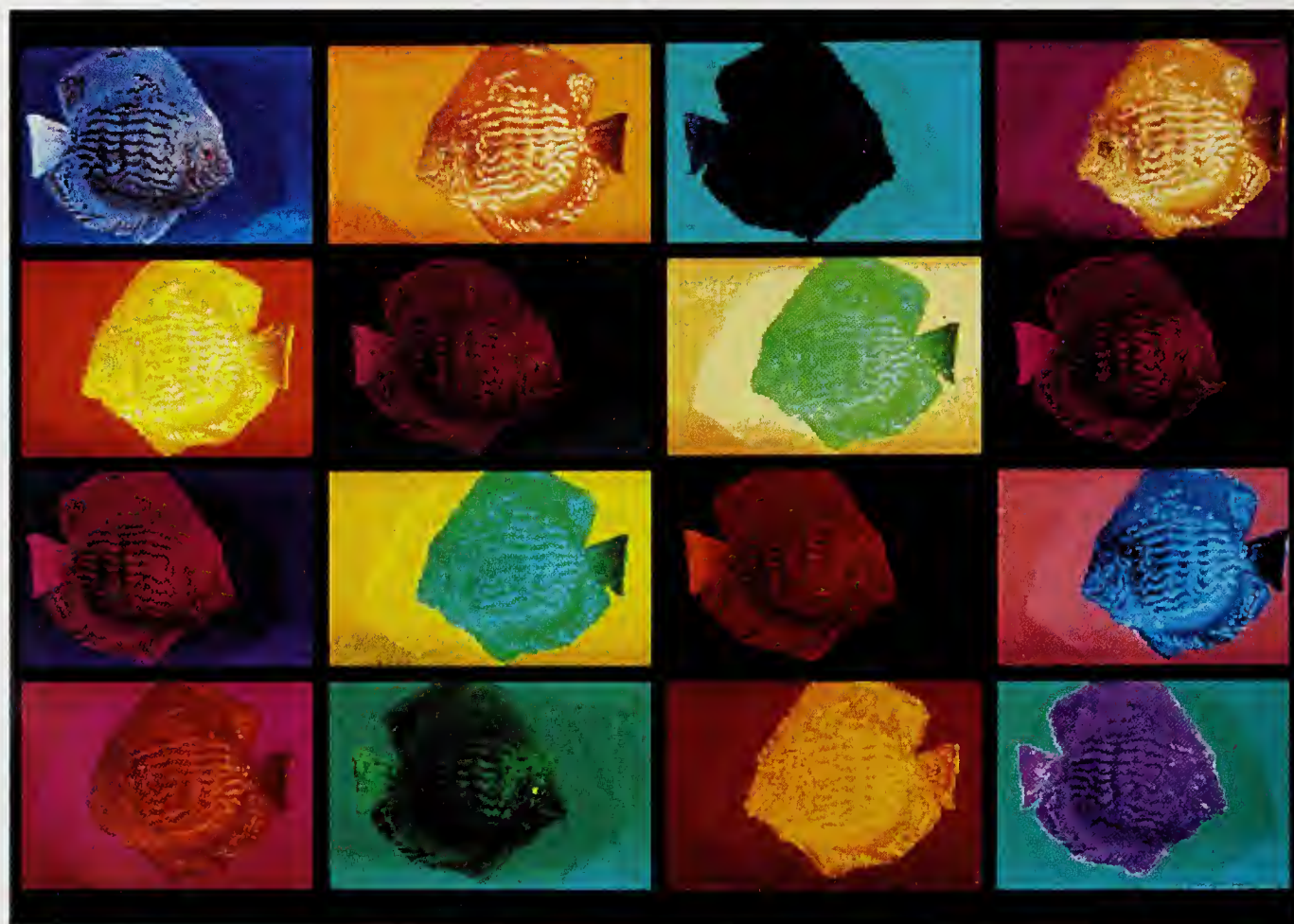
*Deborah
Ivanoff*

Butterfly
Independent designer Deborah Ivanoff of Cardiff, California created this metamorphic image in FreeHand. Each segment of the caterpillar was selected and its pathway opened. Then the corresponding butterfly segment was also opened. The blend tool was used to create the intermediate steps. The parts in each stage of the change were arranged from front to back, closed and grouped so that the stages could be sized, rotated and arranged in a circle.



*Richard
Cordero/Steven
Goehring*

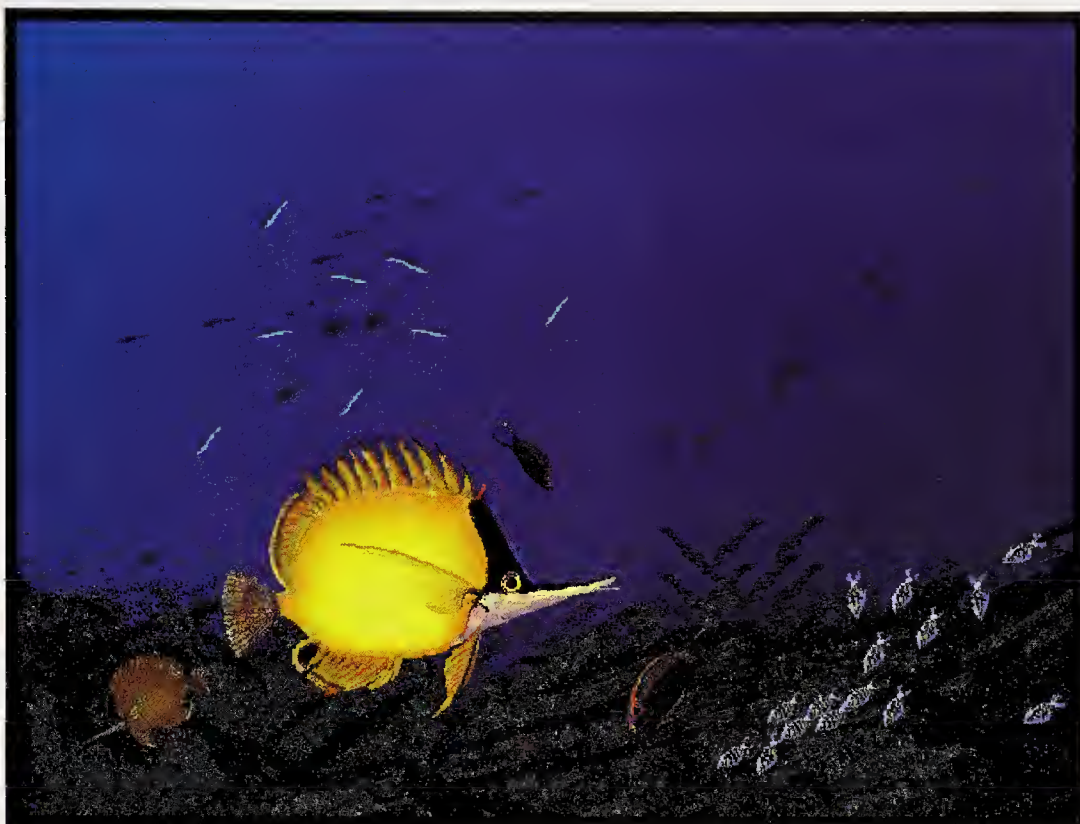
Fish
The original fish illustration by Goehring was scanned on a Sharp JX-450 flatbed scanner, and then duplicated and colored by Cordero using Photomac software on the Mac II. The 24-bit PICT2 file was output to a Presentation Technologies Montage FR1 film recorder. (Reproduced here from a dupe of the original transparency.) The artists reside in Orange, California.





Don Woo

Shanghai Tiger
Reef Fish
 San Francisco-based
 Woo specializes in
 editorial and advertising
 illustration with the
 Macintosh. "Shanghai
 Tiger" was composed in
 Studio 8 for use in
 Activision's game
 "Shanghai." "Reef Fish"
 was also painted with
 Studio 8 on the Mac II.



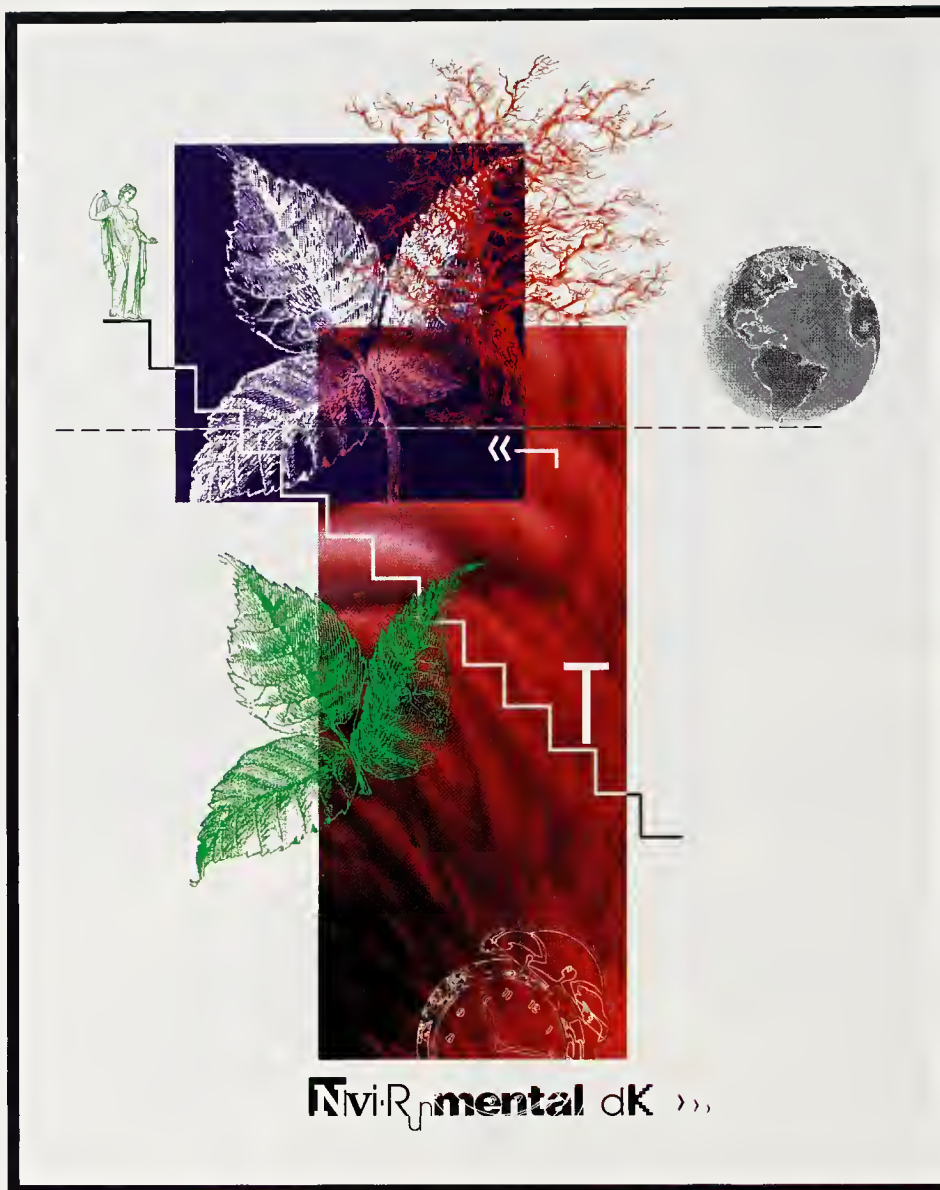
Victor J. Lafica

Papagayo
 A professional portrait
 artist, Mr. Lafica has
 just recently begun
 painting with TARGA
 software on an HP
 Vectra system equipped
 with a Truevision 24-bit
 graphics board and a
 digitizing tablet. He
 used the RIO software
 and a Hewlett-Packard
 PaintJet printer for the
 final print, which was
 separated traditionally
 for reproduction here.

Mark Paglietti

Environmental dK

Canadian-born Paglietti, who now lives and works in the San Francisco Bay area, started with clip art from MacGraphics 3.0: Venus (standing in for Mother Nature), a dead tree, leaves "clipped" from a rose and modified in Canvas 1.0, and a clock that was opened in Adobe Illustrator 88, autotraced with minor modifications and saved as an EPS file. The earth was borrowed from GraphicWorks 1.1 and cleaned up slightly, and a simple sphere was created at 72 dpi with the air brush tool. The elements were gathered in PageMaker 3.02CE; a flamingo provided with the Color Extension upgrade was cropped and enlarged to give the cloudy "black hole" effect.



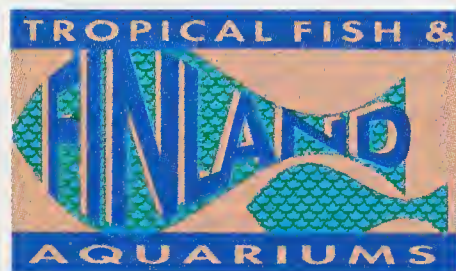
David Herrold

**Slash and Burn
High-Speed Chase**
Herrold, associate professor and chairperson of the Art Department of DePauw University, created these prints as composites of many conventional photographs taken at different times and places, scanned with Thunderscan and blended with Digital Darkroom. The 6 x 20-inch panorama format lends itself to a narrative image that tends to be read from left to right.



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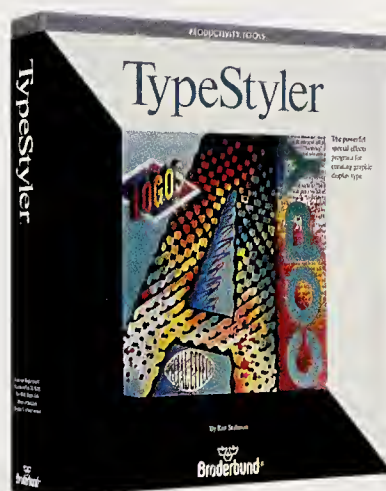
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*From dot matrix and fax
to lasers, high-res
imagesetters, color printers
and color prepress, you'll
see even more diversity in
the kinds of output you
can get from PostScript
interpreters.*

I first became aware of PostScript (though not by that name) in November of 1984, when a fellow computer journalist, Ted Nelson (everyone now refers to him in print as "hypertext visionary" Ted Nelson), mentioned a new printer coming from Apple that had a processor more powerful than the Mac and "a complete Forth-like language" built in. I was baffled. Why would anyone put that powerful a computer into a printer? And why put a computer language in there? I didn't even bother to wonder what "Forth-like" meant.

All has become clear since then. The printer was the LaserWriter, and the language was PostScript. What the printer actually contained was a PostScript language *interpreter* (made by Adobe) that could swallow PostScript page descriptions and turn them into laser dots on the page. In the ensuing five years PostScript has become *the* system for professional graphics output. Just about every printer manufacturer offers a PostScript printer, the NeXT computer is totally PostScript-driven, and even the dinosaurs — the vendors of expensive prepress systems — are figuring out ways to incorporate PostScript into their offerings. PostScript is the standard.

Nevertheless, things are not stable in the world of PostScript. Apple has agreed to trade non-PostScript typeface technology for a PostScript clone interpreter (Bauer's) from Microsoft. Hewlett-Packard is leaking news about a new language for the LaserJet that uses scalable fonts. Microsoft is pushing the graphics model that underlies Windows and Presentation Manager. And everybody seems to be developing or selling a PostScript clone. The question is, then, will PostScript remain the standard for professional graphic arts, design and production? The answer is yes. But you can expect many changes in the coming year — changes involving the PostScript devices you use or have access to, the typefaces you use and how you use them, the imaging model you use to display what you see on screen and the techniques used by PostScript devices for that all-important function, halftoning.

What follows is a rundown of the most volatile aspects of the PostScript world, including a little

background on how they came to this point and some predictions on what you can expect to see in these areas in the near future.

Clones

At least a dozen clones — competitors for the Adobe interpreter — are currently available or soon coming to market. These interpreters do just what Adobe interpreters do: they convert PostScript page descriptions into dots. People are still shying away from the clones, though, and with good reason. They're worried about compatibility.

It's an old story. When the IBM PC first came out, it had no competition. If you wanted to run programs written for the IBM, you bought an IBM. Then came the clones. They were pretty iffy for a while — you couldn't be sure that all programs would run on them — but they were less expensive and in some cases better (more powerful or flexible) machines. Today any off-the-shelf clone will run just about any IBM software.

Similarly, the Adobe interpreter has given rise to numerous clones, but they're still in the iffy stage. Most cost much less than Adobe's PostScript interpreter. GoScript by LaserGo, for instance, which runs as an application on the IBM PC and drives dozens of different printers and screen displays, lists at only \$195.

Also like PC clones, some of the clone interpreters will do things the Adobe interpreter can't. The Eiconscript interpreter, which runs on the IBM PC, will handle much more complex paths (made up of more control points) than Adobe interpreters. Several clones will send the output to a screen, rather than a printer. And the Hyphen interpreter, an expensive offering that runs on several platforms, including Suns and Macs, offers halftoning that many consider superior to Adobe's.

Compatibility, though, is still a question. Even Adobe interpreters choke on some percentage of the PostScript jobs you send them, but the clones have a somewhat (sometimes radically) higher percentage.

➔ **Expect:** The compatibility situation *will* change. The Hyphen interpreter, in particular, is faring very well on compatibility. As with PC clones, the PostScript clones will come to be as

reliable as Adobe interpreters — in some cases more so. Acknowledging the clones' increased viability, Adobe has indicated that from now on it will compete on the quality of its implementations rather than on the basis of its monopoly on the market.

Different Output Devices, Different Setups

When I first grasped what PostScript really is — an interpreter that translates page descriptions into dot patterns at a resolution appropriate for the output device — I immediately wondered, "Why don't they just give me the interpreter on disk, like the BASIC interpreter that comes with MS-DOS?" It could have a menu of output devices that I could choose from. I would send the page description to the interpreter (or the program I'm using would send it), and the interpreter would drive whatever device I'd selected.

That scenario has become a reality, though not with Adobe interpreters. Today PostScript can be used to drive just about every imaginable raster imaging device (a device that prints with dots). Whether you want to send the output to a fax machine, dot matrix printer, laser printer, color printer, slide recorder or high-resolution image-setter, there's a way to do it.

The setups for driving these various devices range from software interpreters that run on your computer (some with high-speed interfaces to the output device), to cartridges that plug into a slot on your non-PostScript laser printer, to controller boards in your computer that are connected to the output device, to dedicated RIPs (raster image processors) that ingest PostScript and drive one or more devices.

Whatever the setup, the choice of output devices is expanding. At least one of the clone interpreters is driving the new Canon color copier. The Adobe-based VIP (Visionary interpreter for PostScript) and Hyphen-based PS/Script turn PostScript page descriptions into huge high-resolution color bitmaps that are then fed to high-end prepress systems for manipulation and separation.

Many clones already offer the advantage of being able to drive several different output de-

Wither PostScript?

■ by Steve Roth

vices. Dedicated RIPs — the system from Birmy Graphics is a great example — will take input from several sources (AppleTalk, Ethernet, parallel, serial) and send output to a variety of devices. They keep track of the PostScript jobs coming in, send the jobs to the interpreter, and send the resulting output to a laser printer, color inkjet printer, imagesetter or whatever. Such flexibility from competitors has driven Adobe to develop its own controller capable of driving multiple devices of different types, the Varityper 4000 series controller.

➡ **Expect:** From dot matrix and fax to lasers, high-res imagesetters, color printers and color prepress, you'll see even more diversity in the kinds of output you can get from PostScript interpreters. And the prices, of course, will go down. You'll also see both Adobe and non-Adobe-based RIPs accommodating several output devices, with all the input and output handled transparently and automatically.

Competitors

Even when PostScript first emerged, people were talking about competitors for this page description language. Imagen's Impress and Xerox's InterPress were both touted as formidable alternatives that would give PostScript some stiff competition. Has anyone heard from Impress or InterPress lately? Not a peep. For whatever reasons, they just sort of faded away into Osborneland.

Hewlett-Packard's PCL (Printer Control Language) — the language the LaserJet understands — has held strong, but it's been hampered by its limited graphics capabilities and its use of bitmapped fonts rather than scalable outlines. Programs that drive the LaserJet must do all the work that PostScript usually does, building fonts and scaling graphics, and then bit-blast dots to the LaserJet. These programs put incredible demands on programmers and users, and don't deliver the flexibility that PostScript does, such as on-the-fly font scaling, halftoning and device independence.

Some new competitors are emerging now, though, that deserve some attention. The Mac's

System 7 will include scalable outline typefaces (they're called "Royal" fonts, after their Apple code name) for both screen display and printed output, and will drive any printer — PostScript or non. Canon's new laser printers include scalable fonts (width-compatible with the Adobe Plus set), and HP's PCL Level 5 (which will be embodied in the LaserJet III or some such moniker) will have similar capabilities.

Another contender worth watching is GPI (graphical printing interface), the printing protocol built into Microsoft's Windows 3 and Presentation Manager. Like Apple's System 7, GPI will use Royal typeface outlines for screen display and output.

What none of these systems can offer, though, is high-res output. All are attempting to imitate on screen and on low-resolution output what will be produced on a high-resolution PostScript imagesetter. Apple and Microsoft have both implicitly conceded that fact by adopting the Bauer PostScript interpreter for output.

➡ **Expect:** You'll see lots of press releases, but not much change. Professional graphic artists and designers are being served quite well by PostScript now, and the competitive systems offer nothing new — except even more questionable results when you're proofing material destined for final imagesetter output.

Typefaces

Notice that I don't call them fonts. The folks at Apple used that term when they released the Mac, since they were talking about fixed-size, bitmapped fonts. Today, we're working with scalable typeface outlines, so we should call them what they are — typefaces, not fonts.

The biggest action in the typeface arena is Apple and Microsoft's adoption of System 7's Royal typeface outlines for both screen display and output. You'll be able to work with Royal typefaces and get output from either PostScript or non-PostScript devices, although it's still unclear how they'll handle the PostScript output. The devices may convert the Royal typefaces to PostScript typefaces and download them as needed when

you print, or a utility may convert Royal to PostScript, with the converted fonts having to be downloaded manually in advance.

With the advent of ATM (Adobe Type Manager) for the Macintosh, which provides both excellent screen representation of PostScript typefaces and output to non-PostScript printers, it's not clear what advantage Royal fonts will offer. Although these typefaces have a more robust hinting mechanism for producing quality type at low resolutions, it remains to be seen how well typeface vendors will do in implementing those hinting techniques.

System 7 will require 2 MB or more of memory, which is technically a full megabyte more than ATM requires. However, since performance is sluggish at best on 1 MB machines running ATM, 2 MB is almost essential. Call it a dead heat between the two systems in that regard.

Some other drawbacks of ATM are that it doesn't run under Windows or Presentation Manager (though it probably will soon), and it works with Type 1 typefaces only. That's a problem in that most non-Adobe PostScript typefaces are in Type 3 format. However, Adobe is publishing specifications for Type 1 typefaces, and most major vendors have announced that they are converting their libraries to Type 1.

The other typeface standards that are emerging — particularly Canon's scalable typeface format and HP's PCL level 5 — are attempts to provide the type-scaling functionality of PostScript without resorting to PostScript per se. Most come with typefaces that are width-compatible with the Adobe Plus set of typefaces, so pages can be proofed with these systems and then sent to a high-resolution PostScript imagesetter for final output.

The typefaces are not shape-compatible with Adobe faces (the letterforms are slightly different), which is problematic for wrapping type around large drop caps and the like. And since the alternative typefaces may not have the same kerning pair values as Adobe faces, problems can occur with letter positioning and line breaks.

Adobe Type Manager
Adobe Systems, Inc.
P.O. Box 7900
Mountain View, CA
94039-7009
800-344-8335
\$99

Canon laser printers
Canon USA
One Canon Plaza
Lake Success, NY 11042
516-488-6700

Eiconscript interpreter
Eicon Technology
2196 32nd Avenue
Montreal, Quebec
Canada H8T 3H7
514-631-2591

Hyphen interpreter
Hyphen, Inc.
187 Ballardvale Park,
Suite B
Wilmington MA 01887
508-988-0880

GoScript
LaserGo
9369 Carroll Park Drive,
Suite A
San Diego, CA 92121
619-450-4600

NeXT computer
900 Chesapeake Drive
Redwood City, CA 94063
800-848-NeXT
\$9995

➔ **Expect:** Competitive typeface outline formats (aside from Royal) will remain a sideshow in the professional graphics market but may find a niche in general office use. Adobe will offer ATM for Windows/Presentation Manager. Every font manufacturer will offer typefaces in Adobe's Type 1 format, so they'll work with ATM. Most will also offer their typefaces in Royal format, so they'll work with System 7, Windows/Presentation Manager and, via those systems, PostScript output devices.

Another possibility is that the clone vendors (including Microsoft and Apple) will adopt a standard for PostScript that is a superset of the Adobe standard. Interpreters conforming to that standard would take Royal typeface outlines directly; without their having to be converted to PostScript typefaces. In that case, Adobe would be in the uncomfortable position of offering a subset of the industry standard. Its interpreters wouldn't be able to handle output that included Royal typefaces.

Screen Display

Although several PostScript clones will "print" PostScript output to the screen, they do so basically as a preview function. You make your pages, interpret them, and then see the results on your monitor. What's needed is interactive PostScript display, so that what you see on your screen display as you work reflects the actual PostScript as it will be output.

That scenario is here right now — for some things, on some machines. ATM provides on-the-

fly screen display for type on the Macintosh, but graphics still rely on the Mac's QuickDraw routines. Any fancy PostScript effects (such as half-tone fills) must be represented on screen without using PostScript.

Display PostScript — Adobe's technology for PostScript screen representation — is fully implemented only on the NeXT computer, although Digital Equipment and IBM have also licensed it and will presumably provide implementations at some point.

The other alternative is to use a different imaging model for screen display than for final output. That's the idea behind System 7 and Windows/Presentation Manager. While these two systems may work well (and may be significantly faster than Display PostScript), they probably won't offer as good a WYSIWYG screen rendition as you get using PostScript for both display and output.

➔ **Expect:** ATM works now, and it works well. While it doesn't address the problems of displaying PostScript graphics on screen, the competing systems offer nothing better, and the screen representations currently incorporated in EPS (encapsulated PostScript) graphics serve very well. Except for those who are lucky enough to own a NeXT machine, Display PostScript still remains a dream.

Halftoning

The one thing that PostScript has that none of the competing systems can offer is flexible halftoning and control over gray screens. PostScript's halftoning


techniques do have some failings, though, especially for color separation. Moiré patterns, in particular, are more common in PostScript-generated separations than in those created by high-end prepress systems (every separation system can create moirés; it's a matter of minimizing them). Adobe has addressed the problems with its halftoning system by developing optimized screen frequency, angle, and cell-shape settings through trial and error. But Adobe has been somewhat hampered by the basic PostScript halftoning machinery and by patents owned by vendors of prepress systems (Hell, Scitex and Crosfield).

At least two companies offer ways to overcome PostScript's halftoning limitations. Optronics has developed an imagesetter that uses the Adobe interpreter but sends any halftoning tasks to specialized hardware and software using proprietary halftoning algorithms (which apparently exceed the quality of, but do not infringe on the patents of, the prepress vendors). Hyphen's interpreter also uses non-Adobe halftoning techniques, though without the dedicated hardware.

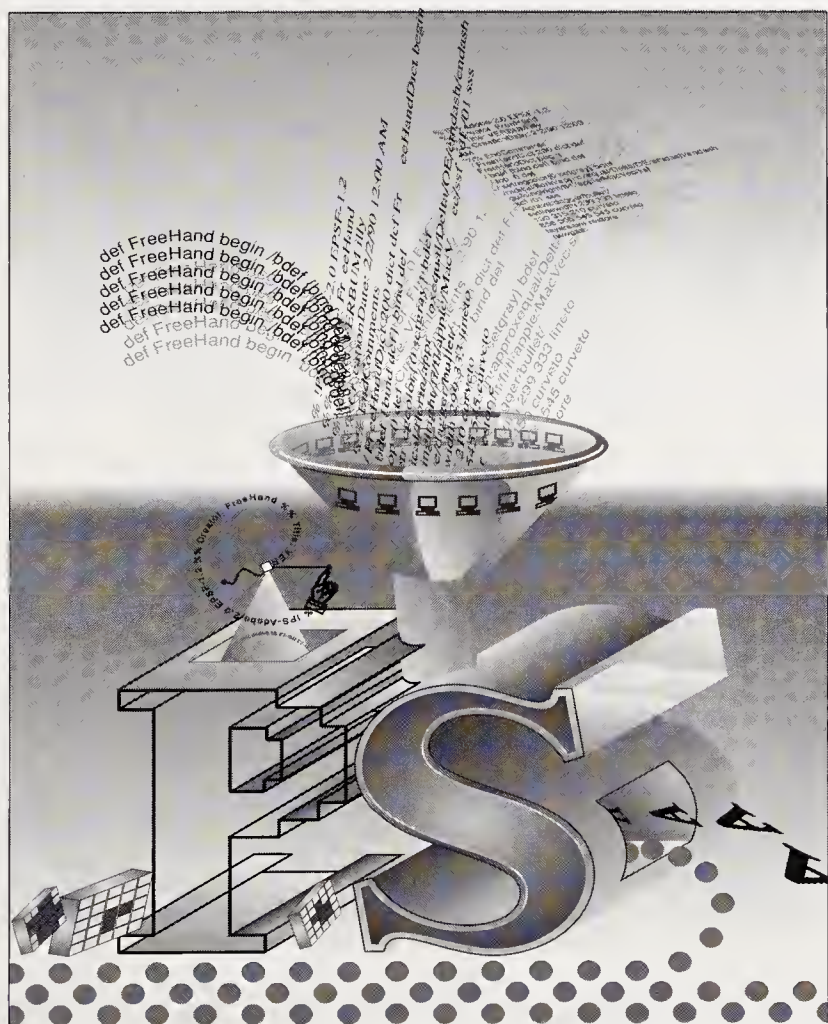
➔ **Expect:** You'll see more PostScript imagesetters that use non-Adobe halftoning techniques. Adobe may even develop techniques that address the current problems and design specialized hardware for imagesetter vendors to implement those techniques. Also expect to see wider use of sophisticated PostScript "spot functions" — cell-shape algorithms that produce diamond-shaped, elliptical and square halftone cells, among others.

What Does It All Mean?

PostScript has come a long way since I first heard about this Forth-like language. More than ever, it answers the needs of graphic artists, designers and publishers. ATM was a major step forward, making the competing systems much less attractive.

At the same time, Adobe has lost its PostScript monopoly. It has competition now, and the history of desktop computing is ample illustration of the merits of that type of competition. In the next year or two, you can expect PostScript to get better and cheaper. Who could ask for anything more? 

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If you're confused about what's happening in the font world, you're not alone. The much-heralded "font wars" (Apple and Microsoft's attempt to contest the domination of high-quality digital type by Adobe PostScript type) seem to have calmed down. (One of the armies — Apple's Royal fonts — hasn't really shown up on the battlefield yet.) Meanwhile, floods of digital fonts are pouring out of a score of vendors. I count a least 14 different versions of Garamond, for example. Finally, a generation of type manipulation programs that are easy to use threatens to call up an infinite set of recruits to this horde of typefaces. Even type enthusiasts are beginning to scratch their heads at the rapid changes in this industry.

Dispatch from the Front

Just as the primacy of PostScript fonts in the graphic arts was beginning to be accepted, and just as the idea of a unified, universal source of high-quality faces from all foundries (through PostScript) was beginning to cause even skeptical typographers to smile, Apple announced its Royal font format, a type technology designed in response to the wish lists of typographers, that includes more advanced hinting for changing character outlines with changes in type size, among other things. And then, at last fall's Seybold conference, Apple announced an alliance with Microsoft to bring Royal font technology to the OS/2 operating system. All at once the inevitability of PostScript was called into question. The digital type world, which was getting in some ways simpler and simpler, suddenly started to become more complex.

Add to that Hewlett-Packard's recent announcement of a 600 dpi laser printer at a very reasonable price, and we have an even knottier situation. The HP announcement, which threatens to shake the LaserWriter and the low-end service bureau markets profoundly, also relegitimizes Compugraphic's Intellifonts, supported by HP printers, at a time when they seemed ready to start fading away.

Mike Parker, a noted observer of the typographic scene and former manager of the Linotronic/Mergenthaler type line, sees no big problem in all these developments. He sees "one big page-description language emerging with three basic flavors." For those three flavors — Apple's

Fonts in Conflict

QuickDraw, HP's PCL and Adobe's PostScript — PostScript serves as the solid center of the font industry at present and the medium of interchange in the future. As Parker and others point out, Apple has promised that it will not abandon PostScript, and that its Royal font format will run under it.

PostScript Versus Royal

Parker sees Royal fonts, with their ultimately superior technology, as likely to become important after several years. "Royal is a type designer's dream. It's a profound idea, courageous — it maps the future." On the other hand, he does caution that

there are still problems. Making fonts that fulfill the potential of the Royal format is exacting, slow work. While quick font conversions can be made, getting the best possible quality is by no means simple.

It must be said that not everyone entirely agrees with Parker. Dan Barthel, president of The Font Company, which packages and distributes Parker's Nimbus-Q fonts for the Mac, takes exception to the use of Royal fonts as high-end, seeing their immediate place with the non-PostScript inkjets, laser printers and other low-end printers. (Nimbus-Q is an older generation of font technology that provides a fast, relatively easy way to digitize and port fonts, but it is used on higher-end workstations rather than on pc's.) It's probable that Royal, if it does succeed, will be used first for low-

resolution devices, not high-end ones. But the recent introduction of Adobe Type Manager (ATM) has allowed PostScript fonts to be used in some low-resolution, non-PostScript printers as well.

Barthel and Parker do agree, however, on the difference between the two formats. Royal fonts have been called smart fonts with a dumb rasterizer, while the PostScript solution is a smart rasterizer with dumb fonts. In other words, much of the development work that goes into PostScript goes into making a smart driver for a LaserWriter or an imagesetter that interprets relatively simple font instructions. PostScript fonts are less onerous to make, but porting PostScript font technology to a new machine can be expensive and time-consuming. On the other hand, much of the work in



creating high-level Royal faces consists of making a detailed font description that can be run on a wide variety of machines with relatively dumb insides. Getting onto a new machine with Royal is relatively simple, but each font takes more work to create than its PostScript counterpart would.

Matthew Carter, chief designer for Bitstream, who designed ITC Galliard and Charter among many other faces, described Royal's chief advantage as its potential for variation. In the past, the best faces varied in proportions as they changed in sized. In other words, a 12-point Bodoni had different proportions than a 48-point one. "Some of this sophistication was lost with photocomposition," points out Carter, where all sizes had the same proportions, and this is currently true with all digital type (although Adobe fonts and others do have hinting at lower type sizes only). The Royal font system has the potential for gradually reshaping the proportions of any typeface and thus making finer, more pleasing headline type.

Adobe will have to match this functionality in time. Says Carter, "If Adobe specs stay the same, they'll be at a disadvantage." However, he and Parker agree that Adobe will probably update their font algorithms to allow for this refinement.

Indeed, one of the advantages of the font wars that all can see is the beneficial effects of close competition. Carter states that "although PostScript is a standard, a monopoly is not a good thing. I worked at Linotype years ago when Linotype had a virtual monopoly in terms of its type library. Though it was a privilege to work there, the monopoly was not good for the industry. After all," he explains, "there's an ecology of typography, in which multiple competitive environments are a good thing that keeps everyone honest."

Jeff Level, manager of the Monotype font collection agrees. But he cautions that it may take a few years before the quality difference between Royal and PostScript fonts becomes fully apparent. "Providing all the features that Royal has will take time." Just as it took a few years for high-quality PostScript fonts to be regularly produced, Royal won't spring onto the scene in full glory.

The first typeface you buy is like buying overalls — something you absolutely need; but at about the fifth or sixth typeface, it's like buying a necktie. After a while, you're buying faces only for vanity; asking others, how do I look?

Most observers see that if Royal does survive, it will coexist with PostScript. "There may be a little confusion at first," states Carter, "but in the long haul, there's a benefit to the competition that's more important than simplification." As many observers point out, the potential competition has already caused Adobe to reveal some of its "font secrets" to other companies releasing PostScript fonts, and also has made Adobe more eager to please customers and to accommodate other PostScript developers. Losing the monopoly status really changes a company's attitude, as far as the consumer is concerned, a change all for the better.

HP

A new army in the font wars is Hewlett-Packard. While HP with its hundreds of thousands of LaserJets is the dominant manufacturer of laser printers, it has been seen as a supplier of relatively low-resolution fonts for office use. Now, with a very-low-cost 600 dpi output, HP threatens to take over an even bigger chunk of the low-end DTP market, and, as a consequence, it breathes new life into the Intellifonts that it supports. As Parker notes, "The boys from Boise [where HP's printing operation is] play their game well. They have an antialiasing chip on the printer and are getting amazing quality at LaserJet prices." Compare the \$17,000 that Varityper charged not too long ago for its 600 dpi PostScript printer (they now charge around \$12,000) to see the amazing advance represented by the HP price of under \$3000 for the 600 dpi machine. Compare even the \$5000 to

\$6000 that you'd pay for a 300 dpi Apple LaserWriter!

In fact, both Royal and PostScript fonts (with Adobe's Type Manager) should work well on the HP printer as well. You won't be able to do complex graphics on the machine, as you can with PostScript printers, but it will sell, no doubt.

And since HP gives away few fonts with its machines, the sales of Intellifonts should boom. At 600 dpi, more serious work can be done with these printers and the demand for a variety of faces should grow rapidly.

Who Needs 'Em All?

Even if we all need the typeface competition to keep Adobe honest, the question is, who needs all those faces? Mike Parker has a good answer. "The first typeface you buy is like buying overalls — something you absolutely need; but at about the fifth or sixth typeface, it's like buying a necktie. After a while, you're buying faces only for vanity; asking others, 'How do I look?'"

And it's the vanity of advertising that, according to Parker, is the driving force behind all variation in type design. Ads have to compete with the typeface used in the body text of a newspaper or magazine and with each other. "As advertising has grown, the number of faces available has increased steadily." He speaks from his own experience at Linotype. "In 1960 Linotype offered 240 fonts, 40 to 50 distinct typefaces. When I left, there were 1400 fonts and 700 faces. The market gets

bigger and bigger, with more versions of each font every year."

In part, the explosive growth has resulted from changes in technology, Parker explains. "It took us 2½ years to introduce Helvetica, our first phototypeset face, and it cost millions of dollars. Any decision we made had major financial consequences. It was like an architectural decision." With the advent of photocomposition, and even more so with digital type, the type house's role has changed, says Parker, "from architecture to fashion."

Playing to the vanities of the customers is an important factor, agrees Barthel. "The business of a graphic arts studio is to establish a unique identity. So there can never be too many fonts." As Parker puts it, "It's never happened yet that we've reached saturation level with fonts, and it probably never will."

So, in the PostScript arena at least, companies like Barthel's can make a living in spite of Adobe's dominance. "When our customers (graphic designers and typographers) buy type, they're often trying to match something that exists. We carry three versions of Bembo, for example: Monotype's, Linotype's and Berthold's. Each of the three is unique to the discerning eye, and you want to buy only one of the three, but you can't really substitute one style for another."

And the flood has just begun. Vast collections of phototypesetter display typefaces exist (faces created for headlines only and set on dedicated machines); Barthel and others are about to start releasing them in digital form. In addition, all the type distributors I talked with mentioned new faces that are presently in development.

Not that designing a good fundamental typeface is made much easier by computers. Matthew Carter still designs his faces by hand, seeing gains only in the refining process, which he does on the computer. But the production aspect of the job is markedly shortened and simplified. As a result, says Parker, type suppliers are able to release "ephemeral typefaces," ones whose popularity they expect to last for a short time only, especially when they're based on existing designs.

Having large typeface collections, even with faces that never sell, helps companies to attract buyers. As Barthel says, "They 'ooh' and 'ah' over the

Continued on page 56

OCR Comes of Age

■ by Mike Kelly

I think I've died and gone to heaven. "100%" the computer screen reports to me. OmniPage 2.1, coupled with my Apple Scanner, has finished scanning a printed page into my Mac. I import the page into Ready,Set,Go 4.5 and open it up to see if it's true. I can't find a single error. OmniPage has successfully captured 100 percent of my test document. OCR, have you ever come a long way since our last encounter.

It's been 10 years since I last directly encountered optical character recognition (OCR) technology, and the screen wasn't reporting back "100%" or anything close to it then. In fact, it didn't work. The small San Diego type house I worked for bought an OCR system. It was an expensive combination of hardware and software. The owners bought it so we could skip rekeyboarding customers' documents, especially the larger manuscripts. The resulting savings would give us a competitive edge and increase our profit margin.

We would put the stack of manuscript pages into the document feeder. Each page would then be drawn into the scanning hardware. The characters were captured and transferred to a typesetting disk. The first page was ejected and the next drawn in. When it finished we would open up the captured document files on our typesetting screen. Of course, we were told to expect a few errors which we could easily catch in proofreading. *Right*.

Our OCR system never worked as advertised. We never captured a high enough percentage of correct characters to justify not rekeyboarding. Our expensive investment never paid off. In fact, we never quite recovered from it financially. Today, OCR is a different story. You can couple off-the-shelf software with almost any scanner and have a workable OCR desktop system, whether you're a large or small shop. Since a wide range of scanners are suitable for this work, we'll focus on the critical element, the software. First, let's take a look at what's involved in optical character recognition.

When an "a" Is Not an "a" Is Not an "a"

Optical character recognition technology faces formidable technical challenges. For example, in a type house, client documents and manuscripts come in many nonelectronic forms. Dot-matrix printers vary in the number of pins they print with and, hence, how close they come to "letter-quality" results. Documents output from another typesetting machine or a laser printer may come in one of hundreds of typefaces. Or, you may be asked to

prepare a new edition of a text from an earlier, printed edition. Even typewritten documents come in many different typefaces. Broken type, light printing or other environmental factors can complicate things further. Kerning, monospacing and proportional or fractional spacing also affect character recognition. OCR technology doesn't have to simply differentiate 26 letters of an alphabet, uppercase and lowercase, one from another. Rather, the task is to do that *and* differentiate one letter "a" from hundreds of possible variations of the same letter.

"How Will I Recognize You?" She Asked

If you've ever set up a blind date to meet in front of the movie theater, you've probably asked or been asked, "How will I recognize you?" It's not enough to say "I've got two arms, two legs, a head, and . . ." or, "I'll be wearing pants, shoes, socks, and a shirt." You have to be more specific. OCR has the same problem when scanning a manuscript.

OCR software can draw on two different recognition tools to scan a document. One approach focuses on a character and creates a graphic bit-map for it. It then checks this graphic against a library of graphic character maps that come with the program. This is called by various names, including *matrix*, *pattern* or *template matching*. The second approach uses *feature extraction*. Here the focus is on recognizable parts of a character—the loops, the horizontal and vertical lines, the thickness of a stroke, and more, which are checked against a library of shape information. The latter, as you can see, approaches the task the way a type designer would analyze a typeface. Low-end OCR software uses the pattern-matching method, while high-end products use artificial intelligence techniques with feature extraction, and often use pattern matching as well. The results at the two ends are dramatically different. The higher-priced software is much better at reading a wide variety of type accurately.

Rule-based logic, artificial intelligence and libraries of graphic character maps and extracted features require lots of memory and processing power. In both the IBM and Macintosh worlds, the best OCR software requires lots of RAM, lots of hard disk space and the more powerful microprocessors—if you're to process documents with any efficiency.

Besides varying in their recognition tools, OCR programs also differ in how they approach the whole deciphering process—some are *auto-*

matic and some are *trainable*. Automatic programs come ready-to-use out of the box. You fire them up to scan your documents and they either recognize the type or they don't. There are only a few variables, such as contrast controls, that you can control. Examples of these programs are OmniPage, Datacopy AccuText, MacinText, MacOCR and Publish Pac. Trainable ones aren't ready-to-use when you break the shrinkwrap. You have to train them to recognize the particular type in your document. The software focuses on a character in one window and you type in the character from your keyboard in another window. The program builds up a library for *this* typeface for this document and documents using the same face. Trainable programs include AutoRead (despite its name), Read-It!, ReadStar II Plus, TextPert and TextScan. One program, TextPert, successfully combines some automatic features with its main orientation of trainability.

There's Automatic, and Then There's Automatic Overdrive

Automatic OCR software breaks down quickly into low-end and high-end products. The low-end ones cost less and do less. They generally employ matrix pattern checking and are *slow* and *very limited* in how many faces they can successfully read. These include MacinText, MacOCR and Publish Pac. If the documents you'll need to scan are typewritten or use a typeface that these programs already support, these may be fine for you. Call the company before buying and ask if your document style is supported. Low-end packages also capture less page and word formatting than the more sophisticated ones. They also don't do well on multiple-column formats, spread-sheet formats or tabular materials. MacOCR and Publish Pac can read type only in 10- to 12-point sizes, while MacinText can read 8- to 12-point. Several of these packages are adding feature extraction techniques in future updates and may become more versatile and a better buy. (Although still being sold, MacOCR is not being promoted or supported by Xerox. Their AccuText is a superior product and indicative of the company's future direction with regard to OCR.)

For comprehensive automatic character recognition, you'll pay two to three times what you pay for a low-end product. For a professional shop confronting many different source documents with different faces and quality of printing, it's worth it. The more sophisticated feature extraction technology allows the high-end products to recognize

most typefaces under varying print-quality conditions. Let's look at two of these products.

OmniPage 2.1 is the easiest to use of all the OCR products. When I tested an earlier version, it did well on a variety of typefaces and document types. Setup (from starting up the computer to successfully scanning my first document) took five minutes, including the time to figure out the typical, intuitive Mac interface. Trying it on a variety of

proofreading task. You can activate an error search and catch many of the unrecognized characters. I did find that it missed a number of words where it thought it had recognized the characters correctly, but hadn't. Yet another add-on product from the company can help with this. OmniSpell can be purchased and activated during editing to match words against its dictionary, improving your electronic error-catching rate. You have the

with at least 8 MB of space, it costs \$1995. The high cost of the latter includes a Co-Processor Board requiring a full-length slot.

Datacopy AccuText 1.1, Xerox's entry into the automatic OCR field, is a strong one. Like OmniPage, it can capture page format information. It can recognize and reproduce changes of more than 2 points in type size; it's the only document processor I know of that can do that. It also does



JACK DAVIS

documents, I came up with one major complaint. It couldn't even begin to read a dot-matrix printed document I scanned.

However, the company has announced Version 2.1, and a companion product, OmniDraft, to read Draft-mode or dot-matrix printing. When I tried the new version, it didn't do much better on my first attempt, despite adjusting the contrast setting in the program to allow for a somewhat light printout. I decided to play with my Apple Scanner settings before giving up on it. I adjusted the black/white contrast to the maximum, my brightness to the minimum, and my threshold for distinguishing whether a pixel is black or white to the minimum. I saved my settings and activated them. When I rescanned the document, OmniPage did much better with the new scanner settings. This time, it captured about 90 percent of the text correctly, a great improvement, *but not enough to save me rekeying the document*. It needs more refinement to be useful. (I'm a fairly fast typist, and for me, typing is a lot more automatic than editing a document.)

When it comes upon a character it can't recognize, OmniPage 2.1 doesn't agonize over it like older versions. It simply flags the character with a symbol or letter and moves on. This is a typical OCR strategy for flagging unrecognizable characters. Even in the better-quality documents, it's common to find cracked or smudged type, a stain or some other factor that makes recognition impossible.

Since no OCR program can scan all documents with 100 percent accuracy, you have to plan to proofread for errors. This new version of OmniPage has a more robust editor to help with the

choice of ordering any one of a dozen language dictionaries in place of U.S. English. Version 2.1 can also recognize foreign character sets, although activating that recognition does slow it down noticeably. It can also capture word formatting such as bold and italic type, although not always reliably.

After all the tests, I still found myself wanting a training function for those characters it was missing in some of the lesser-quality documents. My wish list for future versions would also include a full range of contrast controls. This would improve scanning accuracy for dot-matrix and lightly printed copy. OmniPage is fast, easy-to-use and reasonably priced, at \$795 for the Mac version, for the power it brings to OCR. If your shop confronts a wide variety of documents, and not too much dot-matrix or poor-quality printing, this package is a good choice. The company, Caere Corporation, has also shown its commitment to continually upgrading the product, not a negligible factor. I would hope that OmniDraft is included in the base product in the future. For me, it's not an "option," but a necessity.

On the Mac the program requires at least 4 MB of RAM, a hard disk drive, and a 68020 microprocessor or higher. This means you need at least a Mac II or an SE with a 68020 accelerator board installed. For the IBM there are two versions. For a 386-compatible running Microsoft Windows, a high-density drive (either 1.2 MB 5.25-inch or 1.44 MB 3.5-inch), 4 MB of RAM and at least 8 MB of hard disk space, the cost is \$895. For an IBM/PC AT compatible, with 640 K RAM, a 1.2 MB, 5.25-inch high-density disk drive (a 720 K 3.5-inch version can be ordered by mail), a hard disk drive

a good job of recognizing type styles. If your documents include graphics as well as text, AccuText will pick up both in the same pass. OmniPage will do both, but separately. AccuText will generate a PICT, TIFF or MacPaint file. Like OmniPage, it can output text in a variety of formats, not just plain ASCII.

One weakness is the way it handles characters it doesn't recognize. AccuText uses feature extraction, but checks it against a dictionary when it doesn't recognize a character. If it finds a "reasonable" match, a legitimate word, it converts its "guess" into a word, rather than flagging the character it couldn't recognize. This can result in its replacing a word that was correct in the original with a different, albeit correctly spelled, word in the scanned document. No spell checker will catch this type of mistake. Only a human proofreader can. My own preference is to have the character flagged as an error, rather than have the program guess at a substitute. AccuText's superior text formatting capture is attractive, but its error handling is a negative, compared to that of OmniPage. We can expect Xerox to upgrade AccuText, promising stiffer competition for OmniPage in the future. The program will run on an SE with an accelerator board, an SE/30 or the Mac II line.

Trainable, but There's a Hitch

Once educated, trainable software is faster and more accurate than automatic OCR products. But it takes time to train one of these programs to accurately read the typeface in a new document. Often it has to make several passes through the page to train itself to recognize a single character,

Continued on page 32

The Interlocution Solution

■ by Christopher Yavelow

Speech is faster than typing, faster than pointing and clicking, and much more convenient in situations where the hands and eyes may be busy with other tasks.



As we enter the final decade of the millennium, speech is emerging as a viable computer interface. New and affordable solutions to both voice recognition and speech synthesis are bringing Arthur Clarke's HAL (from *2001*) closer to our desktops.

True speech-based interaction with computers as suggested by Apple's famous knowledge navigator videos implies two-way communication. While several current hardware and software tools easily handle one side of this transaction or the other, their integration into a single package is yet to come.

Speech Recognition by Humans

We tend to think about speech recognition from the computer's point of view when, in fact, human recognition of speech produced by a computer is equally challenging. Crucial information conveyed by context-dependent intonation, pacing and syllable stress is lost when a computer starts talking.

Two approaches to speech synthesis are common: sample-based and rule-based. With sample-based synthesis whole words, fragments, and sometimes sentences, are digitally sampled, with table-lookup being used to construct an output string (a word or series of words). The advantages of this system are low computational overhead (not much RAM needed) and high listener comprehension. Disadvantages are limited vocabulary, poor handling of unknown words and immense storage requirements.

Sample-Based Synthetic Speech

There are several situations where sample-based synthetic speech is ideal: voice mail and interactive information services. Most of us have dealt

with voice mail systems that direct us to various mailboxes using push-buttons on a telephone. These systems have long been available for the IBM market and have recently appeared for the Macintosh in Magnum Software's TFLX Voice Mail system.

The use of sampled speech for voice mail on LANs (local area networks), WANs (wide area networks) and telecommunications networks will be very hot this year. Typically, the user speaks his message into a microphone connected to the computer or digitizer. An icon is created that replays the message when clicked upon by the recipient.

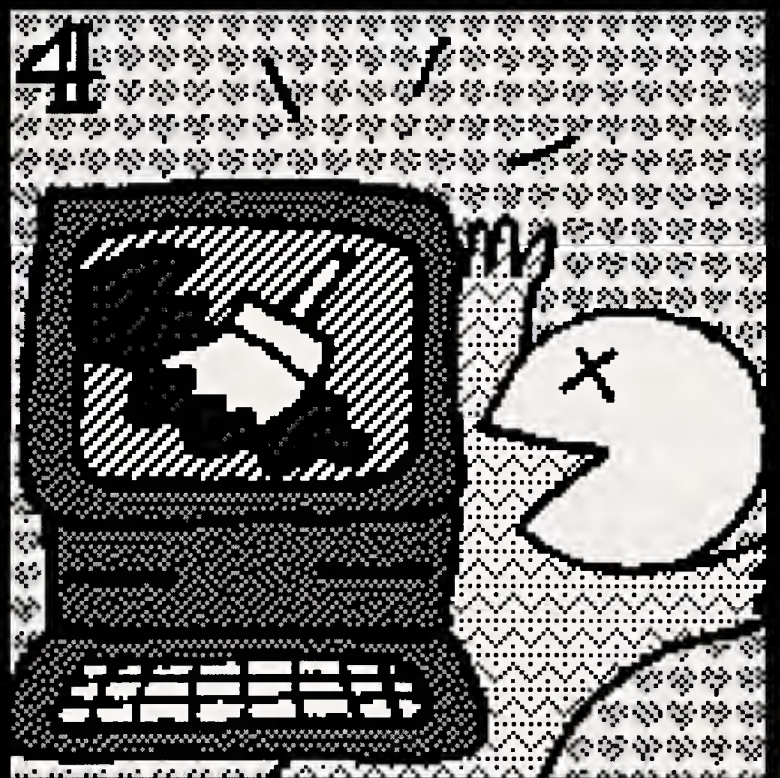
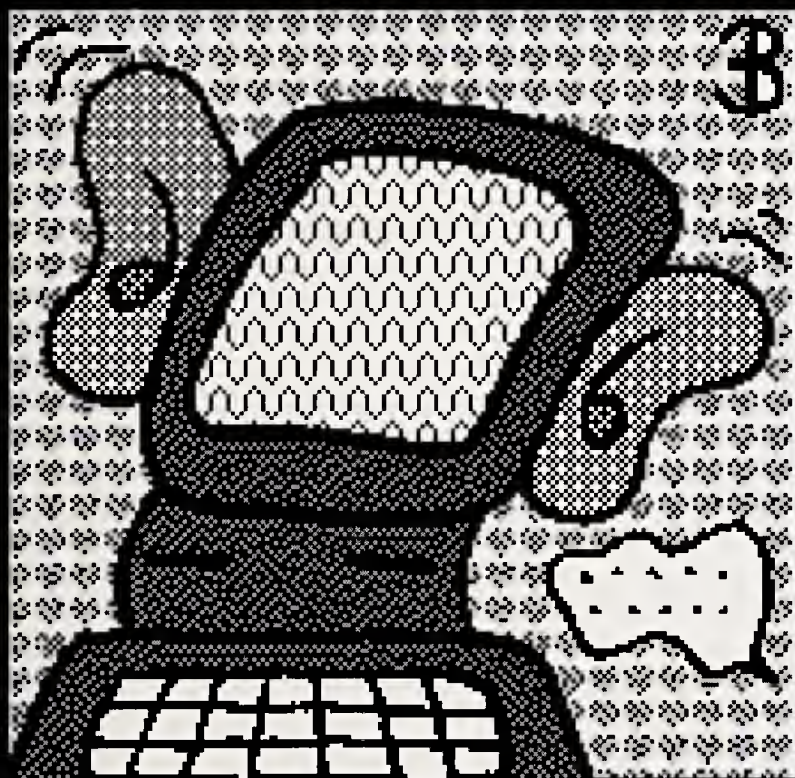
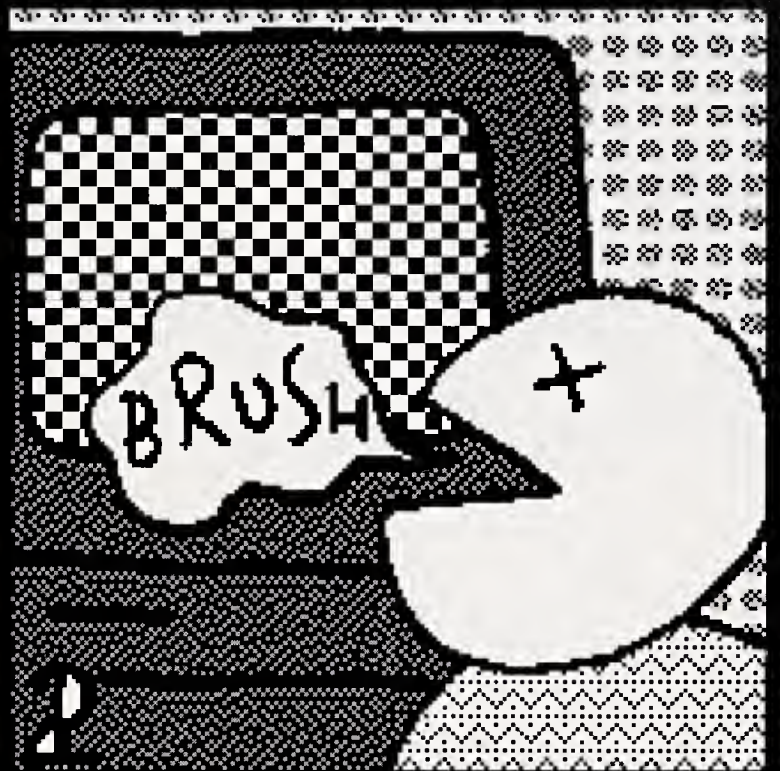
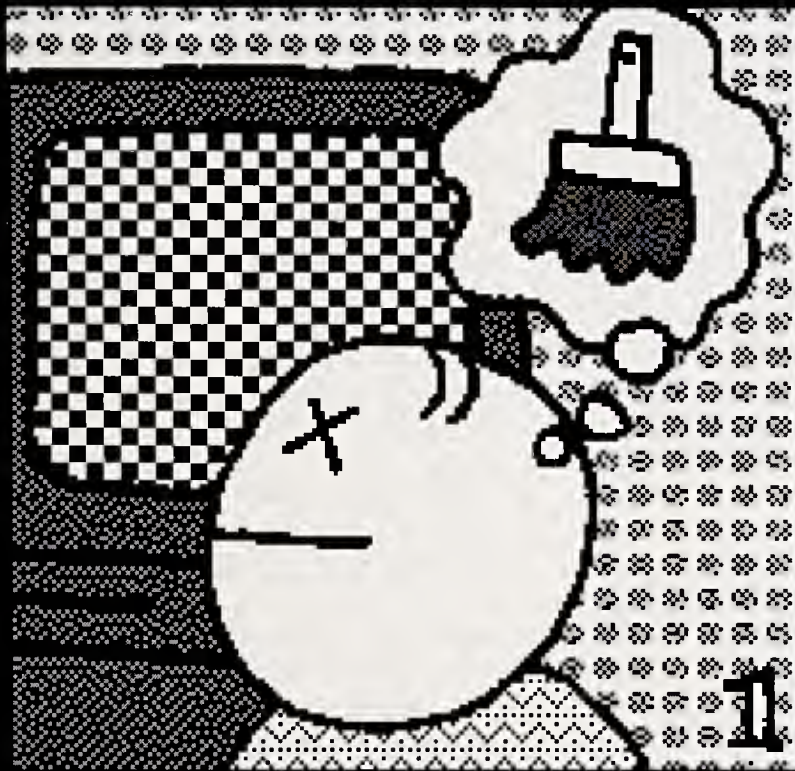
Voice mail of this kind is standard on the NeXT computer and under development by various companies for the Macintosh. The digitizer of choice for the Macintosh is the Farallon MacRecorder, a low-cost (\$160) serial port 8-bit sampler with sampling rates up to 22 kHz. With a wide installed user base, Farallon's recent decision to make the box available to OEM developers has stimulated companies such as Studiotronics toward V-mail development of this type. Farallon itself has a similar system running in-house via Microsoft Mail, as well as a still-unreleased utility for attaching verbal comments to documents created by any Macintosh program.

Another computer with onboard sound digitization and playback is Sir Clive Sinclair's new Psion Mobile Computer. The system employs a revolutionary compression scheme. Consider that a single second of CD-quality sound requires about 177,000 bytes. The Psion portable compresses a second of audio into a mere 133 bytes! You wouldn't want to record music with this, but it's adequate for voice. One and a half hours of user-editable sound can be recorded to tag appointment diary or alarm entries with spoken messages, or simply to record meeting dates.

Novel uses of sampled speech are appearing in such unexpected places as the America Online telecommunications network. Here, an immaculately sampled voice provides useful information by interjecting announcements like "You've got mail" and "File's done" (great for background



JUNKO HOSIZAWA





If you've got a Macintosh, you know all about WYSIWYG (what you see is what you get). If you're a musician you may have experimented with WYPIWYP (what you play is what you print). Well, we are about to enter the age of WYSIWYP (what you say is what you play). When you start talking to your Macintosh and it responds, the way you interact with your computer will never be the same. I've used Articulate Systems' Voice Navigator for several months and the following are realistic scenarios.

Use Prose to Compose

You walk up to your computer and say "launch [the name of your favorite sequencer]." The program opens. You experiment with some drum licks on your MIDI keyboard. You say "record" and your sequencer starts recording. You like it, so you say "loop track 8 times" and then "add a track" and then "assign track 2," "to MIDI channel 7" (where your bass sound is). You keep going until you've built up an elaborate sequence. And your hands have never touched the Macintosh keyboard or the mouse. In fact, your hands have never left your MIDI keyboard. On top of that, while you recorded the last 12 tracks, you never even opened your eyes.

Just Say It to Play It

You sit back. Without looking at your computer, you say "playback." The music plays. All of a sudden you decide that the brass stabs aren't the right sound. You say "edit track 11" where the stabs are. You say "razzle-stabs," which happens to be the name of one of your favorite brass patches. The patch changes to razzle-stabs. You don't even remember that razzle-stabs is patch number 117. You don't have to — just saying the name calls up the right patch.

If You Want to Tweak It — Speak It

Now you're not even aware that there's a computer in the room. All you're concentrating on is the music. The strings seem a little early so you say "start edit," "bar 13," "end edit," "bar 17," "track 6" (where the strings are), "Delay 14 ticks." The track shifts. All that remains is the volume information on the melody track, so you loop the playback and say "overdub." While it's playing, you say things like "louder," "softer," "very loud," "crescendo," "pianissimo" and so on, and the volume data is merged with the track. But during this stage of the process you haven't touched any controllers. You haven't even had to remember what controller was sending that MIDI data. All you had to do was compose.

Yakity Yak, Multitrack (Don't Look Back)

You've got to go from your MIDI sequencer to multitrack, but your engineer didn't show up, or you don't have one, or you don't need one. You need both hands on the mixing board so you usually line up the mouse with the on-screen play button and hit it with your big toe, or you use the Macintosh keyboard with similarly triggered macros. Still, between takes you have to run across the room and squint at the screen to mute or solo groups of tracks. With the Voice Navigator, you can just sit at your mixing console and issue all the track muting/soloing, rewind, sync and start playback at . . . commands with your voice, never taking your eyes off the mixer's meters nor your hands off the faders.

"Computer ON . . ."

The immortal lines from Star Trek IV have never before rung so true. After traveling into the past (our present), Scotty walks up to a Macintosh and says "Computer on!" When it doesn't respond, he picks up the mouse, thinking it must be a microphone, and starts talking into it in a futile effort to communicate with the Mac. After using the Voice Navigator for about a week I began to feel that I had merely been holding hands (or mice in this case) with my Mac for all these years, and now our relationship had progressed to the next level. Merely a few weeks later I was so immersed in the interface that I started talking to other people's Macs and expecting them to respond — so I can fully empathize with Scotty. Now that my Mac and I are on speaking terms I can't imagine ever going back to the point-click stage. The Voice Navigator shares an important subjective quality with the Macintosh itself — that is, once you start using it, you'll wonder how you ever got along without it. ♡

What You Say Is What You Play



downloading). A harp alerts you to private flash-mail. Also, when a contribution to a conference thread is typed in, a sampled soundfile may be selected for emphasis. This sound is triggered on the computers of all conferencees possessing the same soundfile.

Brite Star Technology's InterFACE™ package (Interactive Facial Animation Construction Environment) brings us closer to the knowledge navigator. The product's core, HyperAnimation®, was recently granted a broad patent on its talking agent user interface technology. These agents provide lifelike "coarticulated" animation that adds realism by varying images according to speech context, not just speech sounds. Besides being captivating, it dynamically enhances information assimilation. Current users include Boeing, United Airlines, Microsoft, Arthur Young, Walt Disney Imagineering and Citicorp. Apple recently added two talking agents to the 10,000 "Renee and Dave's Excellent CD" CD ROMs they pressed for developers. Some forthcoming interoffice V-mail systems will employ talking agents. Because InterFACE components are essentially XCMDs (add-on commands), they are supported by any software permitting such externals — Hypercard, Supercard, Director Interactive, Wingz, Foxbase, 4th Dimension, Pascal and C.

Rule-Based Speech Synthesis

Rule-based speech synthesis systems convert ASCII text to speech on the fly using algorithms and "exception" dictionaries. This will be familiar to any Macintosh owner with the Macintalk resource. Although these systems provide a theoretically unlimited vocabulary and efficient memory requirements, the computational overhead is high. Uncommon words and proper nouns are generally mispronounced, and humans experience less comprehension and recall of material presented via this kind of synthetic speech.

There are literally hundreds, if not thousands, of programs and utilities that use Macintalk. Many of the above-mentioned V-mail systems, as well as InterFACE and HyperAnimator, may optionally use Macintalk rather than sampled sound.

Berkeley Systems' OutSpoken, primarily designed for the visually impaired, uses Macintalk to read text on the Macintosh screen, the contents of dialog boxes, menus and anything else the mouse moves over. By incorporating OCR (optical character recognition), the Kurzweil Reading Machine, a dedicated hardware device for the blind, carries rule-based speech synthesis to its culmination.

Speech Recognition by Machines

Current voice recognition exploration is focused on either discrete (single-word) or continuous speech. The field is further divided into single-user and speaker-independent systems. Most research is funded by DARPA (Defense Advanced Research Project Agency), the organization that sponsors the Speech Recognition and Natural Language Conference every year.

The first thing that usually comes to mind when one considers voice recognition by computer is a word processor that types everything spoken to it. The realities of the situation are that continuous speech averages 100 wpm (words per minute), good typists can type 50 to 75 wpm, but the disconnected speech required by existing discrete word-recognition systems imposes a 40 wpm maximum speed limit.

The first widely used voice recognition system of this kind was produced by Kurzweil Applied Intelligence. The device rapidly evolved into their turnkey medical reporting VoiceMED package addressing three areas: VoiceRAD (radiology), VoiceEM (emergency) and VoicePATH (pathology). The latest incarnation of their \$26,000 development system, VoiceREPORT, features a functionally unlimited vocabulary for discrete words and complete speaker independence.

In March 1990, Dragon Systems formally released their DragonDictate 30K voice recognition system. The 30K indicates a 30,000 word vocabulary. This \$9000 board requires a 386 machine running at a minimum of 20 MHz. Also employing discrete word recognition, DragonDictate uses a speaker-independent adaptive training process that "learns" the way you speak so that recognition gets better and better the more you talk to it — no initial word training is required.

Building on Dragon's technology, Articulate Systems offers the Voice Navigator for the Macintosh at just over \$1000, thereby bringing voice-recognition into the affordable price range of a decent hard disk. The system is not aimed at the "listening typewriter" market, but rather toward contorting existing programs and automating chains of commands into macros triggered by a single word or phrase of your choice. Once trained, recognition is extremely high because, just like the Apple interface, which disables menu items that are inapplicable at any specific time, the Voice Navigator is always keeping track of similar information and only listening for whatever commands make sense given the particular situation. This permits a virtually unlimited vocabulary with 200 words active at any given time.



There's a lot more to the Voice Navigator. Built into the hardware are a 2400-baud Hayes-compatible modem, Group 3 fax capability, single-line (expandable to multiline) telephone interface, and voice digitization and playback. The firmware is there. As the software develops you'll be able to telephone the Voice Navigator and remotely control your Mac via voice over the phone, have it fax you or someone else documents, retrieve and read electronic mail with its built-in voice synthesis, or create a voice mail system that can be activated with the buttons of a touch-tone phone. The possibilities are endless, and interfacing the unit to an X-10 hardware controller could expand voice control to other devices in one's environment.

The Vernacular Is Spectacular

Speech I/O should be seriously considered by anyone whose work would be enhanced by freeing up the hands or eyes to deal with other productive activities. If your software's interface has ever disrupted your creative train of thought, rest assured that you can remove this distraction. Menu and palette access time is virtually eliminated as is a good deal of excess mental baggage previously required by computers. Logical candidates are musicians, graphic artists, CAD/CAM users, and anyone using a macro-making utility to speed up program operation.

Using language to control your computer turns out to be faster, more convenient and even more intuitive than the user-friendly point-click-window-menu-driven interface introduced by the Macintosh. Speech is faster than typing, faster than pointing and clicking, and much more convenient in situations where the hands and eyes may be busy with other tasks. ♡

Christopher Yavelow is a computer-assisted composer, author and consultant living in Hollywood. He received graduate degrees in music composition from Boston University and Harvard, and diplomas from several European conservatories, and his works have been honored with more than three dozen international awards. His over 80 articles on music software coupled with his consulting and beta-testing activities on behalf of virtually every Macintosh music developer have had a major impact upon the state of computer music.

America Online
8619 Westwood Center Dr.
Vienna, VA 22182
800-227-6364

DragonDictate
Dragon Systems
90 Bridge St.
Newton, MA 02158
617-965-5200
\$9000

InterFACE and HyperAnimator
Brite Star Technology
1450 114th Ave. SE,
Suite 200
Bellevue, WA 98004
206-451-3697
\$499.95 and \$199.95

MacRecorder
Farallon Computing
2000 Powell St. Suite 600
Emeryville, CA 94608
415-596-9000
\$249

NeXT computer
900 Chesapeake Drive
Redwood City, CA 94063
800-848-NeXT
\$9995

OutSpoken
Berkeley Systems
1700 Shattuck Ave.
Berkeley, CA 94709
415-540-5536
\$395

Psion Mobile Computer
118 Echo Lake Road
Watertown, CT 06795
203-274-7521
\$1199-\$2999

Studiotronics
1035 South Semoran
Blvd. Suite 1031
Winter Park FL, 32792
800-780-3825

TFLX
Magnum Software
21115 Devonshire St.
Suite 337
Chatsworth, CA 91311
818-700-0510
\$2995

Voice Navigator
Articulate Systems
99 Erie Street
Cambridge, MA 02139
800-443-7077
\$1295

VoiceREPORT
Kurzweil Applied Intelligence
411 Waverly Oaks Rd.
Waltham, MA 02154
617-893-5151

If you're anxious for to shine

In the practice of **DESIGN** 

[*And be a hero of our culture*],

You must dig up ev'ry echo

Of dear **Art Deco**

[*And be a kind of visual vulture*].

There's a mine of graphic nifties

In the
hitherto

scorned



[*And it matters not which is the end up.*]

Life is so much less hectic

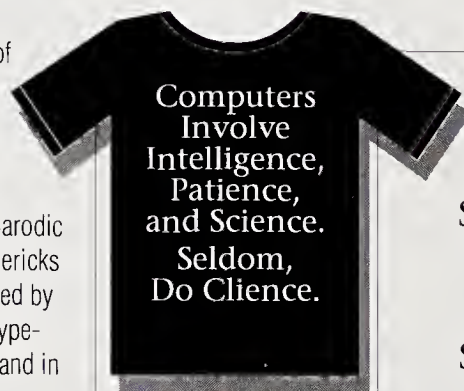
If you settle for **E C L E C T I C**;

[*They'll simply say that it's a send-up*].

Apologies to Sir W. S. Gilbert *Patience*, Act 1

Tom Gould is a graphic designer who finds that the computer gives him a chance to vent spleen, create graphic polemics, release frustrations of the business and generally participate in a line of "bumper-sticker philosophy." The computer-LaserWriter combination allows the development of ideas and idle thoughts alike in type and

graphics, some of which can provide a rich source for future graphic designs. A weakness for parodic doggerel and limericks can also be abetted by the presence of type-setting tools at hand in the studio.



Top, Gilbert & Sullivan parody; center, T shirt design; left, bumper sticker for typographers; right, poster/polemic.

HONK IF YOU LOVE
GGGGGGGG's

A n d

t y p o-

graphy's

a c i n c h

S e t n o

w i d e r

than an

i n c h,

[*With some dabs of*



painted splash in],

Or some Zip-a-Tone

that's scratchy

In a pattern

rather patchy,

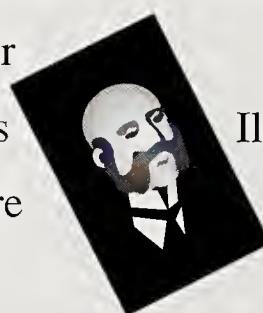
[*Quite requites your graphic passion*].

Scatter

photos

that are

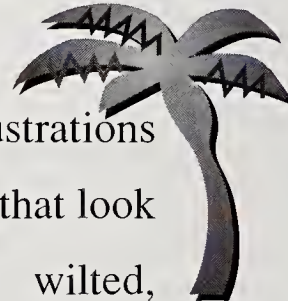
tilted,



Illustrations

that look

wilted,



[*In shades of mauve and peach and pewter*].

O there's nothing quite so fine

As to practice at **DESIGN** 

[*Until replaced by a computer*].

The Marriage of

Something Old, *Commerce*

Something *Déjà Vu*, *and Art*

Something Borrowed, *1990*

Something Pantone® 3262U

“
A C R I D
P O D A
O U R O I
R I N W N
S E E P O S T H R U G H
without a sound
S P R E A D I N G
death
F A N D R
W I D E
THROUGH
THE
WORLD'S
GREEN
COUNTRYSIDE

GROW A TREE
AND WATCH HOW

NATURE WIPES
SWEAT FROM ITS
BROW

REPLACING
CARBON WASTE

WITH CLEAR AIR
THAT SAVES OUR
RACE

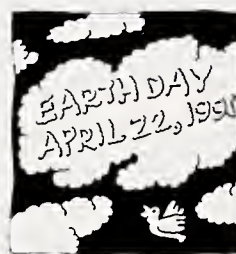
HEAT FULL BLAST
FLAME TURNED HIGH

GET PREPARED
FOR GLOBAL FRY

IF WE DON'T
STOP WARMING

THINGS COULD GET
QUITE ALARMING

”



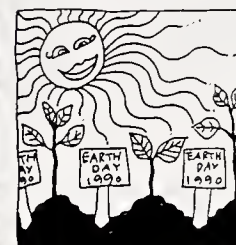
EARTH DAY GOALS
BRIGHT AND CLEAR



TO RID WORLD
OF WORLD WIDE FEARS



UP ABOVE
DOWN BELOW



NURTURING
NEW SEEDS WE SOW

美

Street Poet Ray, a.k.a Michael Redmond, is here with the Word from the Street (see cover). You can find Ray's socially conscious "rap haiku," along with illustrations by Junko Hosizawa, in the new Marvel comic *Street Poet Ray*. The excerpts here, given type treatments by Tom Gould and *Verbum* art director John Odam, are from issue Number 2, which focuses on Earth Day (issue Number 1, a sure

collector's favorite, may still be available at some comic outlets). Both Michael and Junko reside in San Diego (Junko's distinctive illustrations can be found regularly in our pages). Watch *Verbum* for news about our multimedia version of Street Poet Ray, a true 90s phenomenon!



In the home entertainment centers and on the desktops of American households and businesses, an exploding variety of single-chassis products now exist that meld some degree of computer-based retrieval intelligence with diverse, previously incompatible data types such as video, text, music and voice. We have videoconferencing and graphical editors. We have laptops with cellular phones. We have "virtual realities" and Nintendo "data gloves." And as Jackson Browne sings, we even have DISCO (Digital-Integrated Sensor Collection Optics), though I swear I've never tried it.

What are these products and how do we think of them? Are they computer products? Television products? Telecommunications products? Toys? Is there a single word, phrase or paradigm we can use to gain some integrative, benefits-oriented perspective on these products? to get a handle on the convergence as it relates to our own needs as consumers? We consumers, after all, constitute the mass market that provides the ultimate litmus test to any new home-centered communications solution. And it's the home market that drives most of the computer, entertainment and telecommunications companies that are now driving the market — companies such as Microsoft, Apple, Philips and Sony that have the content, delivery or capital resources to hang out 'til the dollars roll in. So we're looking for a term that will corral this beast of convergence into a concept that the living-room-based crowd can appreciate as a worthy possession.

Finding the Right Word

Ted Nelson's term *hypermedia* has been around for more than two decades as a description of the "nonsequential reading and writing of multimedia datatypes." Yes, with a computer you do have random, and thus, nonsequential access. But might not the root *hyper* be a bit stigmatic for consumers? Imagine, if you will, an overactive stereo.

Perhaps the term *multimedia* is a better bet. It's a little older, and many people have heard of it — as the A/V slide guys and rock show laser gals will testify. But *multimedia* might be limited by consumer preconception to a computer or television that does slide shows, for example.

Apple Computer's term *interactive multimedia* is a good description of

What's in a Word?

what you can do with HyperCard and a laser disk or CD ROM. This term's strength lies in the use of the word *interactive*, which acknowledges the most important piece of the mix, the user. So now everything becomes interactive: interactive video, interactive television, interactive telecommunications, interactive A/V. In a sense all user-driven technologies are interactive.

Other Apple-generated phrases also have merit. *Integrated media* is an interesting if unendorsed attempt to coolly describe the convergence of all media. *Desktop media* is a corporate-targeted promotional term that tells us where this convergence occurs.

But at least for consumer markets, none of the terms — integrated media, desktop media or interactive multimedia — seems quite the stuff of a Cleo-caliber campaign for Christmas-time promotion. They don't tell us, the consumers, what value we'll derive from our purchase.

Neomedia is the term I choose to label the interactive communication convergence. Neomedia speaks of a single communications culture arising out of a hundred media disciplines. We speak of designers and programmers

and art directors and telephone operators, all emerging from autonomous pursuits to collaborative enterprise.

The Role of the Artist in Neomedia

As individuals, we may never master all the merging technologies — the mixing boards, PBX, digital converters, telecine devices and satellite controls — that are increasingly populating the studios of the 1990's. But we can learn the passwords to exploit them in our own neomedia pursuits. By exposing ourselves to the key terminologies emanating from television and computers and telecommunications and artificial intelligence, for example, we can begin to extend the boundaries of our own perspectives. We can begin to learn from and communicate with people who know more about other areas of the technology. We can begin to piece together the meanings of various journal articles, television snippets and general gossip and see what roles they play in a cogent plan of action for ourselves. With knowledge we're empowered to craft our own

vision of multimedia within the context of our current skill set and asset base.

To begin to communicate, however, we have to learn some new terminology, most of which we can't find in a dictionary of computer terms, let alone the latest Webster's unabridged (see "Excerpts from a Neomedia Glossary" on page 31). "Buzzwords from hell" we may call them in our frustrated attempts to keep up with the changes, but they do begin to paint the diversity of technologies, concepts and perceptions we must grasp to produce for the media of the 1990's.

Designers and graphic artists must understand that they are no longer just in the graphics business, or the computer business, or even the multimedia business. Along with players in the realms of telephones, cable, movies and books, we're all now in the communications business. As we grasp this and come to understand how we might relate to, provide service to and collaborate with other members of our greater industry via the acquisition of a unifying language, we can move ahead to strengthen our current positions as artists, to determine our niche in future markets, and eventually, perhaps, to realize our ultimate creative dreams.

As the integration of media continues, we'll find it easier and easier to use all media types as the tools of our expression. Unlike today, when conflicting standards, resources and sponsors give way to a confusing mix of industries, perspectives, technologies and language, the integration of all media technologies into a single data highway will lead to a very simple definition of only two roles: delivery and content. Expressive, creative and meaning-rich content will assume its rightful status as an asset equal in importance to the delivery technologies that generate, transmit and display it. ▽

David C. Traub is *Verbum's* multimedia editor. He has been involved with graphical computing and multimedia since the introduction of CD ROM to America in late 1984 and is known internationally for his lectures, magazine articles and other published works. He is currently enrolled in the Interactive Technology program at the Harvard Graduate School of Education and has participated in MIDI and videodisc projects at the MIT Media Lab. He may be reached at Suite 306T, 1430 Mass Ave, Cambridge, MA 02138-3810, (617) 354-3936.



JOHN ODAM

1-900

A new "for profit" telephone service that information vendors can purchase, and that charges a profit from each customer call. 1-900 becomes an increasingly important component to the media product mix as producers try to find new ways to capture and engage a new mass audience.

Algorithm

A step-by-step procedure for accomplishing a task.

Antialiasing

The process by which sequential A/V datatypes are interpolated. In music and sound an "aliased frequency" becomes less distinguishable from the next through antialiasing. In graphics, the jagged pixel blocks of an "aliased image" become smooth.

Branches

Decision points throughout the course of a computer program that provide a user with navigational options. For example, when navigating a historical videodisk, a user might be offered the choice of listening to speeches by George Washington or to those of Thomas Jefferson.

Browse

To navigate through components of a program without a specific destination intention.

Camcorder

Lightweight VHS and 8mm video cameras that are revolutionizing both field production and the reach of video technologies into the home. One of the implications of the camcorder will be the increased use of personal computers to drive low-end video shot with the camcorder.

CD-I

(Compact disk interactive) Philips' first consumer version of the compact disk family of products designed for active user participation. CD-I will be launched in late 1990/early 1991 as a multimedia "home entertainment center" to be plugged into the family television set.

Couch potato

A noninteractive member of the media audience. It's the couch potato that we hope to convert to tomorrow's interactive delivery systems.

Codec

(coder/decoder) Videoconferencing equipment, hardware and software that changes analog audio and video signals into a compressed digital signal at varying rates for transmission over digital networks to be subsequently decompressed for playback at the far end.

CVD

(compact video disk) An analog/digital compact disk hybrid that features analog video and digital audio.

DSB

(direct satellite broadcast) A means of circumventing existing common carrier data highways via the use of direct point-to-point or source-to-multipoint satellite transmission.

Front end

The interface between a user and an application or interface. The front end includes all the command structures such as menu items, icon choice, and so on.

Genlock

The ability to align data transfer rates to combine an NTSC video signal with a computer-generated RGB image.

Granularity

Andrew Lipman's (MIT Media Lab) notion that interactive media must be parsed in such a way that data or content integrity is maintained at any level of discovery. In other words, though a user can transit a videodisk entertainment that presents a specific story line, he or she must also be able to stop at any branching point and explore the spin-off experience with a similar sense of captivation.

Home stack

The master index to all the stacks you can access through HyperCard.

Interactive cinema

A cinema in which the "viewer" takes part in the construction of the story. In the perfect cinematic system, by parsing a movie's narrative components into a taxonomy of scenes, sequences and moves, and by subjecting these to a simple set of narrative rules, a user could make a plot-oriented decision and the computer could respond by constructing a cinematically correct response to that choice that somehow follows an appropriate cinematic logic. Interactive cinema has a long way to go before a computer will actually be able to assist in the creation of significant structures of plot.

Ray tracing

The use of algorithms that simulate light rays as they illuminate a computer-generated image.

Knowledge design

A design paradigm that suggests that, like other products, knowledge must be designed to be effective. The theory of knowledge design provides the user with four domains of knowledge that must be considered: understanding, representation, retrieval and construction.

Natural language recognition

The ability of a computer to respond to commands given by voice or written in a human language. Typically this process employs the use of digital signal processing, a procedure in which the computer compares and matches digital representations of a sound or data entry with representations that already exist in its database.

Replication

The final stage of disk manufacture; during this stage a large number of copies are stamped from a master disk.

Object-oriented language

A programming language that allows a "high level" of interaction; that is, the programmer uses language that approximates his own and is far removed from the basic machine-level code that actually communicates with the computer. A good example of an object-oriented language is Hypertalk, an English-centered language that allows Macintosh users to program their computers without knowledge of how a computer works.

Incubation

A phase of learning described in several contemporary learning theories; in addition to the two-step process of first acquiring symbolic data and then exchanging that data within collaborative contexts, a learner must spend time in solitude to "incubate" the new material in order to solidify the integration of these new data within existing cognitive structures.

Infrared LAN

A wireless circuit, typically used to connect a LAN (local area network), which transmits information by encoding data as pulses of infrared light that is beamed at the ceiling, reflected and picked up by detectors within a 70-foot radius of the source.

Palette

A description of the color choice a computer-based paint program offers.

Parsing

Breaking apart a statement of action into components that can be reconstructed by or for other means. For example, within the context of synthetic cinema, a movie's component plot points are "parsed" into individual sections that can be reconfigured by the computer, depending upon user input.

Sampling

The means by which an analog waveform is digitally represented by measurements of its value at discrete points.

Excerpts from a neomedia glossary

SMPTE

(Society of Motion Picture and Television Engineers) The professional standards committee that determines standards for film, television and their interaction.

OCR, continued from page 23

and you have to repeat this for the roman, italic, bold, and bold-italic versions! For longer documents, or a number of shorter ones that use the same typeface, the time can be a good investment. But if your business is receiving a wide variety of different formats, *you have to go through the training for each one*, because you're building a type table or reference set of characters from scratch for each new typeface.

ReadStar II Plus attempts to add automatic features to its repertoire, but not successfully enough to make our Hybridization category below. Its automatic mode is less reliable than TextPert (see below). Page format and text format recognition aren't automatic and aren't as strong as the other high-end products. But it's easy to use. It bypasses characters it can already recognize and asks you to identify only the ones it has trouble with.

The learning process actually speeds up as you move through a new typeface, since the program learns on the fly from the decisions already made, a strong feature. It differs from other products in the category by using a mathematical model to describe a character. It's flexible enough to recognize the variations that occur in a character so as not to confuse it with another. This makes it one of the fastest-learning programs, once you've mastered it. However, its nontraditional interface is not at all intuitive, and it's frustrating compared to those of the other products. A key-disk copy protection system is cumbersome. I kept forgetting to put the key disk in the drive, so the program would refuse to work. Its eraser tool is good for cleaning up dirty pages. ReadStar II Plus will run on a MacPlus with 1MB of RAM. At \$995 it's not as strong as the equally priced TextPert.

TextScan 3.0, **Read-It! O.C.R.** and **Read-It! O.C.R. Personal** are low-end trainable products. All are suitable for low-volume offices where you face limited variations in documents and the documents tend to be shorter. All are slower, since they rely more on matrix matching than the higher-priced products, and don't offer as many features. For example, tabs have to be manually inserted after scanning.

I once worked for a publishing house that produced phone books for retirement communities. Besides the ads, we had to produce the white pages listings. We worked from existing database printouts. The typeface used was always the same. These products would work well for this type of application. All will run on the Mac Plus with 1MB of RAM, except TextScan, which requires 2MB.

AutoREAD 1.2 was not available at press time. Early reports indicate it's far from automatic, has significant bugs and has a bizarre interface. At \$795, wait on this one.

Hybridization

TextPert 3.01 for the Mac combines features of both automatic and trainable systems. It comes with a set of libraries that you can first scan your

OCR technology doesn't have to simply differentiate 26 letters of an alphabet, uppercase and lowercase, one from another. Rather, the task is to do that and differentiate one letter "a" from hundreds of possible variations of the same letter.

document against. These will recognize many common fonts. Overall, it isn't as accurate in automatic mode as AccuText or OmniPage, and doesn't recognize as many fonts. Even when it does recognize a font, it leaves more errors in the finished document than the other programs. It's not as strict as you could want in matching characters. There's a "Complete" mode feature that will force the program to stop on characters that you already realize are giving it a problem. Its automatic page format recognition (that is, determining where line endings go, paragraphs begin, tabbing, and so on) isn't as reliable as AccuText or OmniPage. However, in manual mode it presents a screen that lets you define the formatting you want it to capture. This facilitates capturing text formats like databases and spreadsheets, for example. For some types of shops this feature alone is worth buying the product.

This software is the only one to attempt to identify, capture and transfer the actual typeface in the scanned document. Somewhat unreliable now, this feature may cause more confusion than its worth. If the company improves this function in future releases, it will give them a competitive edge. In training mode, it's the easiest of the trainable products to use. A great feature is its ability to work in the background under Multifinder — if you have 4MB or more of memory that is.

Reflecting its European origins, TextPert supports 31 foreign languages, more than any other product. A nice feature is the ability to edit these character sets to optimize them for your own needs. Another feature of the program is that it lets you change the order in which text blocks are

scanned in if you wish. You aren't locked into the order of the original document. It requires less memory, 1MB, than OmniPage and can run on a MacPlus. Like the other programs, however, it will run faster with more memory.

If I Were a Rich Man . . .

If you're an IBM shop, the choice is simple, OmniPage. If you have Macs, you have choices. If I had my druthers, I'd buy both OmniPage 2.1 and TextPert 3.01; the former for its fast, automatic mode for straightforward documents, the latter for its trainability. If your shop has sufficient variety and volume of documents to scan in, and can afford the capital outlay, get both types. Except for AccuText's less-than-optimal error handling, it would be a toss-up between AccuText and OmniPage. If you can't justify both program types, you have to evaluate the volume, variety of typefaces, and expected print quality of the documents you'll be scanning. If you expect to confront a lot of different typefaces of poor quality, especially older faces, or lots of dot-matrix output, go with the trainable software. If you'll be seeing mainly modern typefaces in good-quality documents, with little dot-matrix, the automatic program should be the choice. ▼

AutoREAD 1.2
Tutorland
10050 North Wolfe Road
Cupertino, CA 95014
800-888-8689
\$795

Datascopy AccuText 1.1
Xerox Imaging Systems
535 Oakmead Parkway
Sunnyvale, CA 94086
408-245-7900
\$995

MacinText 1.11
Microtek Lab, Inc.
680 Knox Street
Torrance, CA 90502
213-321-2121
\$199

MacOCR
see **Datascopy AccuText**
\$695

OmniPage 2.1
Caere Corp.
100 Cooper Court
Los Gatos, CA 95030
408-395-7000
\$795 for the Mac, \$895 or
\$1995 for PC (see the
text); options for either
PC or Mac: **OmniDraft**,
\$100; **OmniSpell**, \$100

Publish Pac 2.10
New DEST Corp.
1015 E. Brokaw Road
San Jose, CA 95131
408-436-2700
\$395

Read-It! O.C.R. 2.1 and
Read-It! O.C.R. Personal 2.0
Olduvai Corp.
7520 Red Road, Suite A
South Miami, FL 33143
305-665-4665
\$495 and \$195

ReadStar II Plus
Inovatic
1911 N. Fort Myer Drive,
Suite 708
Arlington, VA 22209
703-522-3053
\$995

TextPert 3.01
CTA Inc.
747 Third Avenue, 3rd Floor
New York, NY 10017
212-935-2280
\$995

TextScan 3.0
Prism Enterprises
14703 E. Baltimore Ave.
Laurel, MD 20707
301-604-6611
\$395

Mike Kelly is the owner of **KW Publications**, a publisher of medical textbooks. He is the **New Frontier Products** editor of *Verbum*, and a contributor to *Electric Word* and *NADTP Journal*. Mike also edits a small environmental newsletter and is the environmental columnist for *Peñasquitos News*.

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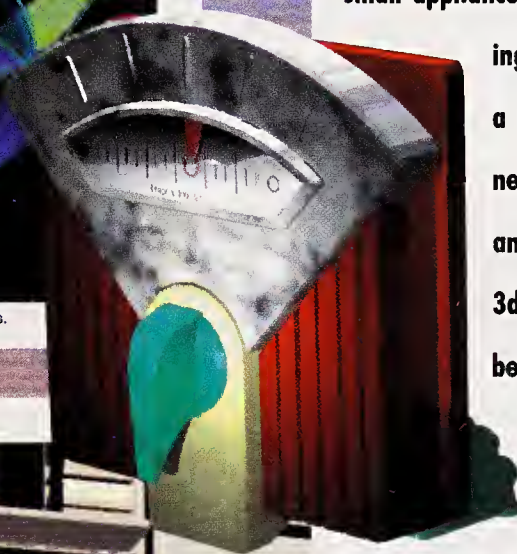
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by John Odam

Stratavision

The screen is black. Suddenly a huge blue square appears, then another, and another in subtly different hues. The cursor dances back and forth, getting progressively smaller as more and more detail unfolds. Soon a beautiful three-dimensional object with shadows, reflections, even surface textures emerges to flesh out the wire-frame armature you've drawn.

Stratavision by Strata turned out to be one of the most exciting programs I've ever played with. I was particularly interested to see how it handled type. I was curious to see what three-dimensional typography entailed.

The program's ability to import two-dimensional outlines, including lettering from many other programs, gives it enormous reach. The 32-bit rendering gives it great depth and definition with an uncanny realism that sets it on a par with imagery from some of the high-end computer systems.

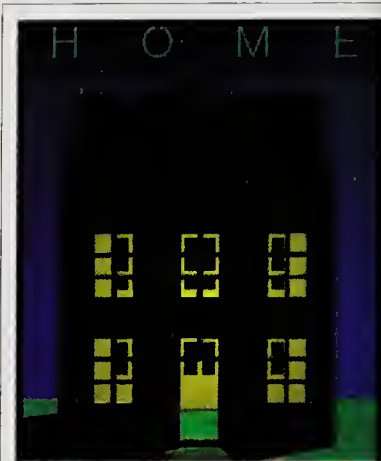
Images are initially created by drawing directly in the program or placing PICT or EPS files from other applications. Displaying objects first as a two-dimensional images in four

views, Stratavision will extrude the depth according to your specifications.

The tools in the Stratavision program are somewhat limited compared to standard drawing programs, but adequate compared to other 3D programs. Many beautiful shapes and effects can be rendered using the basic shapes such as cones, balls and boxes. My wish list to add to the features would include tools for better alignment, distributing, step and repeat, polygon editing and smooth arcs.

Lighting, approached in much the same way a photographer might approach it, includes ambient light and direct light. Lights are invisible objects that can be drawn in any relationship to your rendered object—even inside! They can be angled, swiveled and resized; the focus can be adjusted; and they can even project an image. There are infinite possibilities to manipulate the lighting and its interaction with your object.

Many surface phenomena and other attributes are available. Material features

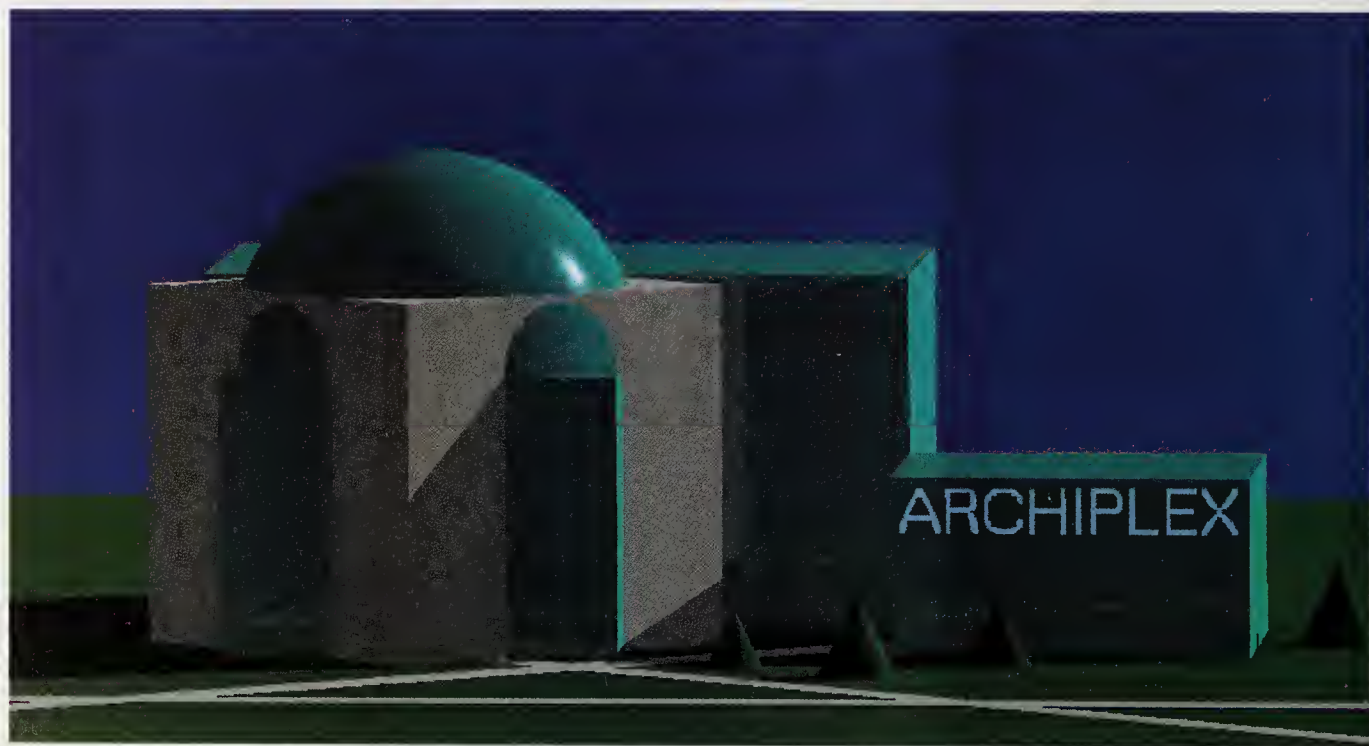


The elevations for this house were "prefabricated" in FreeHand and assembled in Stratavision. With floating, invisible light sources that can be positioned anywhere in the model, objects can be illuminated from within.



The large 2&2 was typeset at 127 points in Aldus FreeHand using Adobe Type Manager. The resulting EPS file when placed into Stratavision degraded somewhat to the level of my manual skills with a sabre saw. I chose a wood attribute and created the look of a wood carving.


Type can be set directly in Stratavision and applied to an object. Simple sans serif fonts seem to work best. More ornate lettering suffers from jagged outlines and should be imported from other programs that can better handle typography.





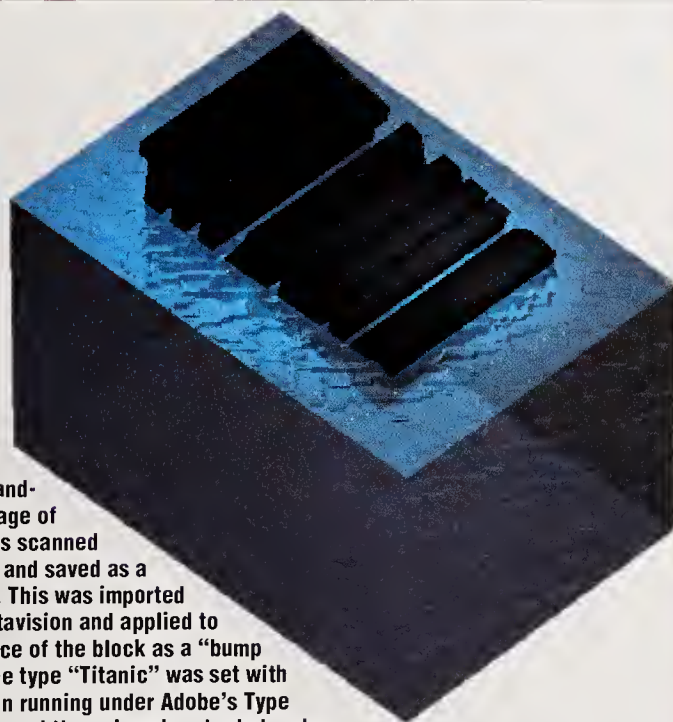
such as stone, metal and wood can be selected from the basic menu. Additional effects can be added separately, created from scans or drawn in color-bitmapped programs such as PixelPaint Professional. An object can be opaque, translucent or reflective, or any combination of these. Imagine the possibilities!

To view the image as it will appear when rendered, a "snapshot" can be selected. The more you select, the longer it takes to render. It's easy to deplete the RAM by selecting large portions of the image. Stratavision files contain all information necessary for further rendering in the program. In addition, you can save the image as a TIFF, for immediate placement into your favorite page layout program or a PICT that can be opened in either a 24-bit or 8-bit paint program, and enhanced or edited.

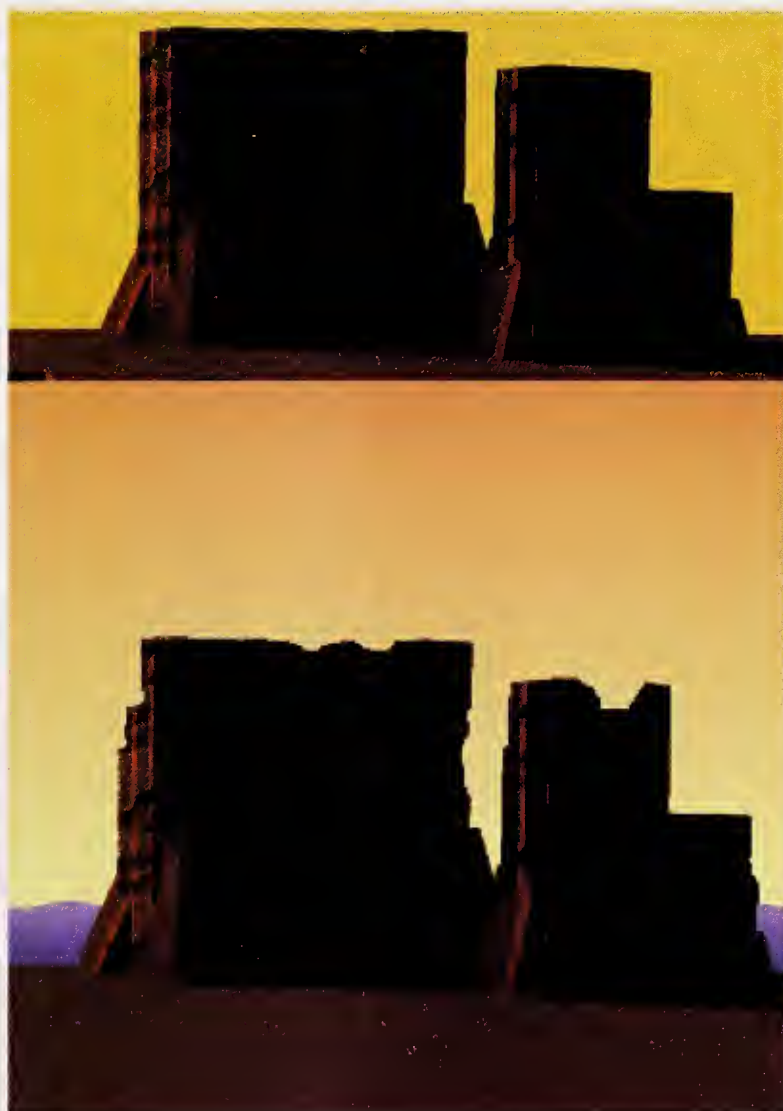
My recommendation to those new to the program is to start by using simple shapes such as cones and boxes or perhaps place EPS or PICT art to create whimsical shapes. From there the possibilities are stratospheric! 

I remapped an Adobe font (Poster Bodoni) in Broderbund's TypeStyler to get the extra-large (240 point) size. This was saved as a PICT outline and placed in Stratavision. Once extruded, the numbers were given the attribute of agate. This file took 10 hours to render!

These buttes were given an attribute of pictured rock from Stratavision's decorative stone library. I opened a PICT of the initial Stratavision rendering in PixelPaint Professional and extended the foreground, added a Utah sky and painted background mountains. For a final touch the silhouette was made more irregular by pasting in portions of the sky background.



A black-and-white image of water was scanned at 75 dpi and saved as a PICT file. This was imported into Stratavision and applied to the surface of the block as a "bump map." The type "Titanic" was set with Type Align running under Adobe's Type Manager, and then placed, extruded and scuttled in Stratavision.



Oh, George! Where Has All the Film Gone?



Lisa Marie Barcomb, a graduate student in the Rochester Institute of Technology's College of Graphic Arts and Photography, created "Myth of Woman" (inset) from an original photo shot with a Canon 760 still video camera. After converting it to digital information with the Canon RR-551 still video player, she manipulated the image with Adobe Photoshop, repeating the face, extending the hair and enhancing the contrast. Finally, she posterized the image and altered the shadow and highlight areas to produce the colorization.

Donald J. Donofrio is a fourth-year advertising photography major at Rochester Institute of Technology. "Spring" was taken with the Minolta Maxxum camera (with still video back) with exposures at $\frac{1}{8}$ of a second, using tungsten lights and colored gels. The photo was digitized using a ProViz video digitizing system on a Macintosh IIfx. The image was resized in Photoshop.

If George Eastman were with us today, he'd probably be wondering what is happening to his wondrous invention, flexible-base film. Well, George, the answer is that film can now be replaced as the imaging medium of choice. And, much as the photographic community moved from the wet colloidal plates Matthew Brady used to record the Civil War, to the Kodak Brownie, and then on to the Speed Graphic, 35mm SLR and the Instamatic, the photographer of tomorrow will be using some form of electronic imaging system. Today we call the cameras still video, but what we'll call them tomorrow, only time and technology will tell.

Over the past 25 years, photography and the silver halide medium have gone through many changes, but few have had the impact on nor the potential to change an industry and profession as have still video and electronic/digital photography systems. To appreciate how far still video has come in a short time, it is necessary to realize that Sony first announced this technology in 1981. In the three years that followed, Canon, Nikon, Fuji, and others established a standard format: a two-inch analog/digital floppy disk capable of holding up to 50 images. The 1984 Los Angeles Summer Olympics saw the first practical use of still video technology, but two years passed before Canon started marketing a still video camera. The first cameras were black-and-white-only, but color followed soon after.

The first publication to begin using still video cameras was *USA Today* in 1987. The following year, their use spread as more newspapers realized the potential of the technology. The Associated Press, *USA Today* and the *Columbia Missourian* all used the Canon still video camera to cover the 1988 presidential conventions. The Associated Press covered the inauguration of President Bush with still video using a Nikon black-and-white camera. The *Dallas Times Herald* recorded the same event using a Canon player/recorder hooked up to Cable News Network, passed the image into a Macintosh computer, and created four-color separations. The *Herald* was on the street with front page, four-color pictures in less than one hour.

In 1989, Sony emerged the technological leader with their new high-band still video cameras and image processing system. And now, in 1990, the big three in still video — Sony, Canon, Nikon — are finding their particular places in the still video market: Sony commands the high-band professional-industrial market in color; Canon has done well in the mid-range and consumer market, and Nikon has a superior product for the black-and-white professional-industrial market. (For a brief summary of still video products of interest to electronic artists, see "Still Video Product Highlights" on page 41.)

These cameras and systems are being used in a variety of ways around the world. The FBI used still video to aid in quick identification of victims of



Eric Klein, also at Rochester Institute of Technology, shot Renee (top) and Michelle with the Minolta Maxxum 7000 with digital back, and digitized the image on the Mac II using the ProViz video digitizing system.

the Pan Am crash at Lockerby, Scotland; J.C. Penney Company of Dallas has a worldwide network of still video cameras and transmitters, allowing its buyers to photograph an item to confirm quality or manufacturing changes and have hard copy color prints in the hands of management in three to five minutes. This saves untold dollars and days in the normal decision-making cycle.

News publications such as *Time*, *USA Today*, the *Dallas Times Herald*, the *National* and the *Columbia Missourian* use still video to provide their readers with images which would not have been possible without that technology; for example, Hank Gathers' sudden tragic collapse on the basketball court was recorded only by video cameras. The three still photos that ran in *USA Today* were frame grabs from television coverage of the basketball game. All the major television networks followed the lead of CNN in covering the political protests in Beijing with still video. When all satellite links were cut, CNN photographers, armed with still video cameras, covered the events and transmitted the startling images out of the country over standard telephone lines.

All of these still video pioneers are helping to make the technology work. To better understand what they are going through, we must understand the technology and its limitations. The difference between still video and conventional photography is in the recording medium. Film is replaced by a charged couple device (CCD), an array of approximately 700,000 very small light-sensitive transistors.

This CCD array converts light imaged by the lens into electrical energy, which is stored as analog video data on a 2-inch floppy disk with a technology similar but not identical to those used for audiocassette or videocassette recording. Most still video cameras can be set to record field mode (50 shots per disk), or frame mode (25 shots per disk). In field mode, the camera records one image on each of the 50 tracks available on the disk for image storage. In frame mode, cameras equipped with two CCD arrays store one image on every two



times the pixel resolution of the color camera. The reasons for this are based, not in technology, but in the laws of physics. The black-and-white-only uses all 700,000 pixels to record an image, but the color camera must divide these pixels among the three primary colors — red, green and blue. This is done by attaching red, green and blue filters to alternating rows of pixels. This effectively cuts the pixel sampling to one-third of 700,000 or 233,333 pixels, resulting in lower image sharpness for color.

The resolution patterns for broadcast TV are different from still video. The CRT electron guns of broadcast television write the screen from left to right in 512 distinct horizontal lines. In still video, there is no sweep pattern; the CCD is an array of discrete pixels arranged in columns across and rows down. The resolution of 300 lines (in the case of standard band) and 500 lines (for high band) is the number of columns across the face of the CCD. On a color camera, the filters are arranged as strips covering all rows of pixels in a given column. Every third column has a repeat color filter: column 1, red; column 2, green; column 3, blue; column 4, red; and so on. And, as might be ex-

tracks, allowing a higher sampling rate and better image quality. When a camera with only one CCD array records in frame mode, the camera does an automatic averaging between samplings and creates the second track information.

Because CCDs are sensitive to differences in wave lengths of light, color recording is possible. The difference between the black-and-white-only cameras, such as the Nikon, and color cameras like the Sony and the Canon is the quality of the recorded image. The black-and-white-only has three



PHOTO: CRAIG MCCLAIN
MODEL: JANE TERPENING

Verbum tested the two inexpensive consumer model still video cameras in a comparative photo session. The photo on the left was shot with the Sony Mavica, on the right with the Canon Xap Shot. Both photos were digitized with the inexpensive ComputerEyes board (see page 41). The cameras are both more or less "Instamatics," with auto-exposure and built-in flash (the flash can't even be disabled on the Sony). We found the Canon did a better quality job overall, with its superior optics and extra features.



A graduate student at the Rochester Institute of Technology, Jacqueline Domin developed "Within" for the cover of an issue of ESPRIT (Electronic Still Photography at Rochester Institute of Technology) a quarterly newsprint tabloid. "Boy" is part of an animated sequence composed of variations on this image. She used a Canon 701 still video camera, and Photomac, Studio 8 and Modern Artist on the Macintosh II to manipulate and color the images.



Associate Professor Douglas Rea heads up the publication of ESPRIT at R.I.T.'s Newspaper Operations Laboratory, School of Printing Management and Sciences. For information, or a copy of the 8 page tabloid, call 716-475-2780.

Alan Brown, owner of Photonics Graphics in Cincinnati, Ohio shot these images with Canon's 701 still video camera, and used the Canon RV-301 player to play them back on video. He used a Truevision frame grabber board to convert the shots to digital form on the Mac II. Mr. Brown has found the immediacy of still video to be an aid in the creative process: Rather than shoot Polaroid test shots, he does a "pre-im" (preimage) shoot and views the shots on a TV monitor. Often the pre-ims are usable, and the

final shoot requires far fewer shots than a typical film session would. Brown likes the texture of video images, "the way the light breaks," and prefers lower-resolution images that he can manipulate to play on the bitmapped look. He comments that

even the best high-band images are second rate when compared to standard film shots.

Clockwise from top: "Ekimi Next Noel" was shot for the cover of an album by the jazz duo Ekimi and developed in Photomac by reducing the overall color

saturation, adding the colored background areas, and sharpening parts of the image.

"Regina" was retouched, with some sharpening and diffusion of the highlights, in Photoshop. The color palette was modified to give the final result.

The original still video photo for "Bird Women" was converted into black-and-white with Photomac and then brought into ImageStudio, where the image was sharpened and slight modifications were made. Finally, it was hand-tinted using Photomac.

"Ekimi," the still video image for a compact disk release by Ekimi, was digitized through MacVision as a grayscale file. Texture was then added with the MacVision software, and the image was hand-tinted with Photomac.



pected, the increased image sampling of the 500-line high band gives a much better resolution and a much sharper image.

All still video is recorded as an analog FM signal. Standard band records white to black over a frequency range of 9 MHz or 10 MHz. High band records the same luminescence values over a frequency range of approximately 15 MHz, or 1.5 times that of standard band, providing better exposure latitude. With high band, the operator can record significantly more shadow detail than with standard band, although still significantly less than conventional film.

Probably the most troublesome limitation of still video is the difficulty in focusing the cameras. Second, the limited dynamic range makes proper lighting a must. There is no such thing as forced processing (pushing film speed) in still video; either the event is recorded or it isn't. Third, the issue of focal length: because of the physical size of the CCD array, the optics of these cameras differ from those of conventional ones. The standard 50mm lens used for a 35mm camera gives an effective focal length of 100mm when used on a still video camera. This characteristic can be either a blessing or a curse, depending on the subject being photographed. (Note: A CCD array has the same physical size relationship to 35mm film as a Kodak disk film frame has to a 35mm film frame. So enlarging a print from a still video results in an equivalent loss of quality.)

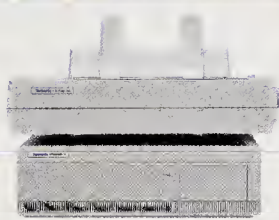
The first step in transferring a still video image to the printed page is to convert the analog video signal to a digital format the Macintosh or PC can handle, through the use of a video frame-grabber board. The better boards are those that capture red, green and blue output from the player rather than a composite video signal because the red, green and blue capture gives a much higher quality. A capture board that grabs each portion of the



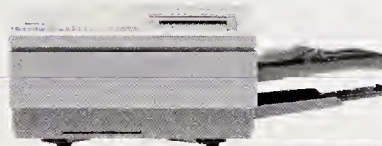
Simply brilliant.



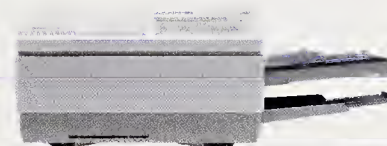
ColorQuick™



Phaser CQS



4693 DX



Phaser CP/CPS

You can't get any brighter than this.

If you want the brightest, boldest color money can buy, you want a Tektronix color printer. No other printer on the market can make you look this good.

And our prices will make you wonder why you ever used black and white. Printers start at \$2495. You can get PANTONE®* certified color that's compatible with PostScript language and Adobe fonts for only \$8995.

The PostScript-language compatible printers come with at least 8Mb of memory, a high-speed processor and 35 resident fonts. Everything you need to create

output that will get you noticed in the flash of a page.

And for even more options, our printers give you 16.7 million colors to choose from. At up to 300 dpi. You can print on paper or transparencies, using a PC or a Mac. And all of our printers come with an on-site warranty.

If it's great color you're after, it's Tektronix you want. No other printer will make you look this brilliant. For information or the dealer nearest you, call 1-800-835-6100, Dept. 10W or fax 1-503-682-2980.

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The best and the brightest.

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This is Apple's Best Buy on a Big Hard Drive;



\$1799

Apple 80 MB Hard Drive

This is Ehman's.



\$749

Ehman 45MB Removable

The perfect hard drive would have unlimited storage capacity, be lightning fast and be as reliable as rain in Seattle in the springtime. And, oh yes, it would have all of the above, at a price that would make the stingiest Scrooge smile.

Using that criteria, the Ehman 45MB removable just may be the perfect hard drive.

Its storage capability expands with your needs. For more storage capacity all you do is buy another 45MB removable cartridge for just \$99. Buy as many as you need. In fact you could buy 10 cartridges, almost 500MB of storage, and still pay less than an Apple 80MB fixed hard drive.

With an access speed of just 20 ms, the Ehman removable will hold its own with just about any hard drive on the market. And with a reliability

rating of 30,000 hours and a warranty of 2 years, you can be assured that in this case, speed doesn't burn. For another \$20, you can have complete assurance and overnight service, with the Ehman Express Service Program.

The best part is that our best buy on a big drive won't burn a hole in your pocket. At just \$749 including one cartridge, the Ehman removable costs less than half of the Apple 80MB drive and comes with a 30 day, no questions asked, money back guarantee. Give us a call today at 1-800-257-1666 and see first hand why Ehman is now the fastest growing manufacturer of Macintosh peripherals.

Ehman

1-800-257-1666


signal individually and then merges the individual 8-bit grabs into one 24-bit file gives the best results. A new board from Advent Computer uses this capture scheme, but unlike all other analog-to-digital conversion boards, the Neotech allows the operator to adjust the brightness and contrast of the analog video signal before digitizing, thus optimizing the digital image passed into the computer. (This adjustment is equivalent to making a lighter or darker print from a film negative.) This feature is extremely important for dealing with images shot under poor lighting conditions.

After a TIFF file or TARGA file is created in the computer, there are three basic image-processing operations that must be performed to make the images printable. The first of these, resampling, found in Adobe's Photoshop, for example, is a data averaging technique used to raise the original resolution from 72 dpi to 150 dpi, which is necessary for good-quality reproductions at the 133-line halftone screen commonly used for printing.

The second process is the image-sharpening function, which improves the pixel-by-pixel

definition of an image and counteracts some of the lower-resolution characteristics of still video. Sharpening is accomplished through a common image filter found in all image-processing software. Each image-processing program performs this function differently, some requiring the image to pass through the filter more than once. (Note: While it may seem like a case of "if a little is good, a lot is better," this is not necessarily so. If the filter is applied too many times, the image begins to break apart into individual pixels and no longer has a smooth blend between tones.)

The third filter is either unsharp masking or edge enhancement, which helps to define where one object in the picture begins and the other ends. These two effects are different, but not all software allows the application of both. Given a choice, it's better to select unsharp masking since the results are similar to edge enhancement but more predictable. If, however, the software only has edge sharpening or enhancement as an option, apply this sparingly to all images. Too much can give the images an outline appearance along all edges.

The final result of this digital photographic process is an image produced in a totally filmless operation. How fast still video will replace George Eastman's brainchild, only technology will tell. At the present rate of technological advancement, still video could replace film in the newspaper and news magazine market within two to five years. Within five years, however, many high volume catalogs requiring rapid production turnaround will be produced with still video and electronic prepress systems. But still video poses little threat to the use of conventional methods for very high-quality color photography — for at least the next 10 years. 

John Seibt, manager of quality assurance and electronic imaging research and development at the Dallas Times Herald, holds A.A.S. and B.S. degrees in Photographic Science and Instrumentation Engineering from Rochester Institute of Technology holding. He has directed letterpress-to-offset conversions at over 40 newspapers nationwide.

Production Note
Pages 36-38, including the color PICT2 files embedded in the PageMaker 3.02CE document, were separated directly from our Macintosh disks on a Scitex color scanner using Visionary software.

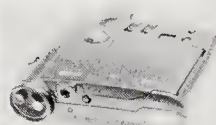
Still Video Product Highlights

Here's a look at still video technology with a bias toward the needs of the electronic artist. Sony and Canon are the major manufacturers of still video equipment. Sony dominates the high-end market, with cameras, players and printers sold mainly to newspapers and industrial users. Canon has a similarly comprehensive product line, but is better equipped for the low-end market.

Electronic artists interested in still video for economical 24-bit color digitizing are more likely to be interested in the inexpensive cameras such as the Sony Mavica and Canon Xap Shot. We tested these two consumer models in a comparative photo shoot of a model, using identical lighting for both shots (see page 37). In general, we found the Xap Shot to have superior optics and autoexposure capabilities, producing far better quality shots in almost every case. Other advantages provided by the Xap Shot are that you can plug it directly into a television or digitizer, while the Mavica requires a separate adapter box; the Canon accepts optional extra lenses, but the Mavica does not; the Canon will shoot clearly as close as two feet, and has a macro lens switch that allows for surprisingly well-focused shots at 12 inches or closer, but the Sony can't shoot closer than five feet for centered, focused pictures.

Here is a sampling of the latest products likely to be of interest to electronic artists, emphasizing the lower-priced Canon and the higher-priced (higher band width) Sony products. Also listed are three video boards optimized for still video digitizing.

The still video camera records images on a still video floppy, which can then be played through a still video player to a tele-



Canon Xap Shot



Canon RC-470 player

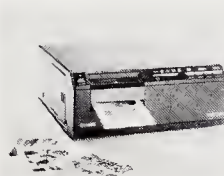
vision set. A frame grabber board can feed the image from the player into a microcomputer. A still video printer can print from the floppy.

Still Video Disks

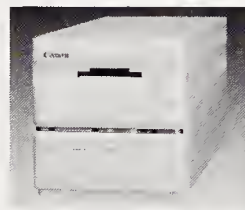
The standard format is available from several manufacturers; each disk holds 50 images in field mode, 25 in frame mode, and costs about \$15.

Canon Products

- **Canon Xap Shot RC-250** The basic Canon field-mode still video camera comes with its own built-in player and retails for \$799.
- **Canon RC-470** This frame-mode camera, with a two-position zoom lens lists for \$2100.
- **Canon RV-301** This still video player comes with remote control at \$890. It provides a better-quality image than the Xap Shot's built-in player.
- **Canon FV-540** This still video player outputs an NTSC signal to the Macintosh SCSI port; it includes software for image selection using thumbnails, and controls



Canon RP-420 printer



Canon FV-540 player

for brightness, contrast, hue and color; it saves images in TIFF and PICT formats. The player will be available mid-year for \$2000 to \$3000.

- **Canon RP-420** This color video printer retails for \$1995.

Sony Products

- **Sony Mavica MVC-A10** The basic Sony still video lists for \$549.95.
- **MAP-T2 Adapter** This plays the still video images through a standard television set and lists for \$250.
- **Sony MVC-5000** This two-chip high-band still video camera is the top of Sony's line at \$6495. It has a 13:1 zoom lens (effective 35mm focal length is 38-494 mm), and list price is \$3495.
- **Sony MVC-2000** This single-chip high-band camera retails for \$2995.
- **Sony MVP-660** This portable still video player lists at \$3600.



Sony MVC-5000



Sony MVC-2000

- **Sony UP-5000** This still video printer accepts RGB or composite video from any standard source as well as from video disk. It's priced at \$6995.

Video Capture Boards

- **Computer Friends ColorSnap-32** This 24-bit video capture board with image database and editing software is \$1595.
- **Digital Vision ComputerEyes Professional Series 24-bit video digitizing board** The board retails for \$449.50.
- **Neotech Image Grabber with color adapter** This frame grabber from Advent Computer Products retails for \$1998.

For more information:

Advent Computer Products, 619-942-8456
Canon U.S.A., 516-488-6700
Computer Friends, Inc., 503-626-2291
Digital Vision, Inc., 617-329-5400
Sony Corp. of America, 301-577-4850



There's More Than One Way To Scan A Cat.

Existing flatbed scanners offer potential; however, they are not the only way to capture quality images into your computer. Unlike scanners which can only copy, Still Video cameras are available to produce truly original images for use on virtually any computer.

Electronic photography offers unlimited creative potential because of its speed and mobility. Advancements in video capture technology have made it possible to acquire high resolution images from virtually any video source; including image transfer devices which convert negatives and transparencies to high resolution video. These are important tools for anyone who is concerned about their image, and their budget.

Ken Hansen, an established dealer of professional photographic equipment, has followed the growth of electronic photography to its present state of refinement. Our knowledge of traditional photography combined with these products, enable us to give you practical advice on how to create better images on your computer.

Visit our fully equipped showroom, and we'll help you explore the alternatives to a flatbed scanner. Ken Hansen's Electronic Imaging Department offers sales, rentals, and lease-to-own programs in a casual atmosphere. So call us, or walk in and discover the options available today.

Canon Canon has developed an entire line of Still Videocameras, players, printers, and recorders. We carry them all, from the easy to use Xapshot® to state-of-the-art high resolution SLR style cameras with interchangeable lenses.

TAMRON FOTOVIX Tamron Fotovix® products provide instant transfer of existing slide or negative images from virtually any popular film format. The high resolution video signal is compatible with Still Video Recorders and image capture boards. Fotovix allows real-time cropping and color correction as well as positive to negative conversion.



Neotech's image capture boards for the Macintosh™ bring Still Video technology to the computer, offering high resolution gray-scale or 24 bit color capture to virtually any file format. It is also possible to control operation of the Canon Still Videoplayer directly from your computer for instant image selection.

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Fax: (212) 473-0690

Fonts and Font Tools

Adobe Type Manager

1.2 (for the Mac)

In the fiercely competitive type wars raging in the fonts market, enhancements are coming fast. Already Adobe is releasing another upgrade to its

istered users. Adobe Systems, Inc., P.O. Box 7900, Mountain View, CA 94039-7900, 415-961-4400, 800-344-8335.

ATF Classic Type (for the Mac)

ATF is shipping a new line of PostScript-compatible outline type from its library of over 20,000 designs. The type includes resolution "hints" for low-resolution output devices. Each face comes with screen fonts, down-

loadable PostScript outline printer fonts, font matrices, kerning pair tables, and the ATF Type Utility. The latter allows adding and modifying kerning pairs and generating additional screen font sizes for better screen display. First face, \$75; two for \$115; three for \$155; four for \$195; five for \$235; six for \$275. Kingsley ATF Type Corp., 2559-2 E. Broadway, Tucson, AZ 85716, 800-289-TYPE, 602-325-5884.

ATF Type Designer I

(for the Mac and IBM)

With this utility, PostScript-compatible outline typefaces and logos can be created complete with resolution "hinting" and optical scaling. With Type Designer I, printer fonts, screen fonts, kerning pair tables and other metric information will be produced as the user draws characters or scans in artwork in TIFF or compressed formats. Bezier curves are supported in the full editing environment. The ATF Type Utility is included for those wishing to modify kerning pair tables, build bitmaps or generate characters in Illustrator format. \$449. Optical scaling at \$1000 and resolution hinting at \$750 are additional. Kingsley ATF Type Corp., 2559-2 E. Broadway, Tucson, AZ 85716, 800-289-TYPE, 602-325-5884.

FontPaks (for the Mac)

Each of the six new FontPaks contains 20 to 26 PostScript typefaces. All

contain "hinting" information to optimize character shapes. \$299 each. Image Club Graphics, Inc., 1902 11th St. SE, Suite 5, Calgary, Alberta T2G 3G2, Canada, 403-262-8008.

FontSet 2 (for the Mac)

Eighteen PostScript Fonts, including Palomar, Gendarme and Konway, are included in the set of Fontographer-based designs. A set of fraction fonts included in the package were based on the original LaserWriter fonts of Times, Courier, Helvetica and Avant Garde. All use NFNT numbering. \$63. EmDash, P.O. Box 8256, Northfield, IL 60093, 312-441-6699.

Fontware 3.0 (for the IBM)

Fontware 3.0 is a "starter kit" of eight typeface outlines for users of the new Microsoft Excel for Windows and Word for Windows. The installation routines included in the initial package will enable users to purchase and run any of the additional 52 Fontware Typeface Packages. \$25. Bitstream, Inc., Atheneum House, 215 First St., Cambridge, MA 02142, 617-497-6222.

Type Manager (see *Verbum* 3.4). Version 1.2 of this font display utility addresses complaints raised against the earlier product. Although users found a big improvement in type sizes 12 points and above on their screen displays and in non-PostScript printer output, little or no improvement could be seen in the smaller sizes, especially in bold type. In addition, the earlier version didn't support Microsoft Word 4.0 and other programs without fractional font widths. Version 1.2 addresses all of these problems. In addition, it offers support for Bitstream and other non-Adobe PostScript Type 1 fonts. \$99 new; free upgrade to reg-

FontStudio & LetraStudio

FontStudio (for the Mac)

FontStudio, a font and logo design package, now permits manipulation of Type 1 and Type 3 Adobe fonts, previously not possible because of Adobe's secret "hinting" associated with the fonts. Adobe's release of the "hints" allows Letraset and other manufacturers to include Adobe fonts among those they can work with. The program can also import fonts from Bitstream, Monotype, The Font Company, Agfa Compugraphic, Fontographer, Cassady & Greene, Treacyfaces, Image Club, URW and others. Logo design is facilitated with an autotrace tool that permits existing scanned images, or those created in PICT, TIFF or MacPaint formats to be read into FontStudio and traced to generate scalable outlines. \$495. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201-845-6100.

LetraStudio 1.5 (for the Mac)

The 1.5 upgrade to LetraStudio (*Verbum* 3.1) adds support for Adobe Postscript Type 1 and Type 3 fonts to this type manipulation software. Previously it was limited to Letraset's own font library. LetraStudio 1.5 is designed to integrate with the new Studio line from Letraset, especially DesignStudio. \$495. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201-845-6100.

Type Align

(for the Mac)

Like TypeStyler and LetraStudio, Type Align is a font-manipulation program. The first software designed to run under ATM, Type Align is a desk accessory that works with page layout, word processing, and presentation software programs. It will output to PostScript and non-PostScript printers. First you draw a line, arc or even a free-form curve. Then you type, copy or paste text onto this path. Once on the path the text block can be rotated, skewed, given perspective, or distorted. RGB, CMYK and HSB color models are all supported and can be applied to a single character, word or phrase. Files can be saved in PICT, EPS or Illustrator 88 formats, or printed directly from the DA. \$99.95. Emerald City Software, P.O. Box 2103, Menlo Park, CA 94026, 415-324-8080.

ITC Typefaces (for the Mac and IBM)

All new typeface designs from International Typeface Corp. will be released as PostScript fonts. The first face released under the new program is ITC Golden, a revival of a William Morris design. The package includes both Type 1 and Type 3 faces. \$169.95. The Font Co., 12629 N. Tatum Blvd., Suite 210, Phoenix, AZ 85032, 602-998-9711.

MacKern 1.01 (for the Mac)

This easy-to-use kerning utility (*Verbum 3.1*) continues to improve with version 1.01. It will work with both Suitcase and MultiFinder. When you want to edit a pair of letters, MacKern presents them in a window at 100-point size. Adjusting the kerning is as easy as moving the scroll bar or entering a numeric value. Another window gives you an overview of this and any other pairs you want to preview. Yet a third window will let you display an actual sample of type to visually check your kerning results. You can easily print from this window for further confirmation. Your kerning pair values can either be saved to a MacKern file or used to merge with or replace your Adobe metric files. \$195. ICOM Simulations, 648 S. Wheeling Rd., Wheeling, IL 60090, 312-520-4440.

ParaFonts (for the Mac)

Tired of the same old 500 fonts in your library? This utility will let you manipulate Adobe Type 1 fonts and create new, custom PostScript Type 3 fonts, with matching screen fonts thrown in. Slanting, compressing, and expanding characters are all possible. A bonus is the ability to generate custom fractions, ligatures, proportional numbers and more. \$99. Design Science, Inc., 6475-B E. Pacific Coast Hwy, Suite 392, Long Beach, CA 90803, 213-433-0685.

PostScript Type Sampler

(for the Mac and IBM)

This type sampler includes over 2800 PostScript typefaces. The 8½ x 11-inch three-ring binder shows all samples in 24-point type, printed on coated stock at 1270 dpi on the Linotronic 300. Faces from 25 manufacturers are shown. An update service is also available for a

yearly fee. \$75 for the original binder; \$80 for yearly subscription update. MacTography, 326-D N. Stonestreet Ave., Rockville, MD 20850, 301-424-3942.

The Art Importer (for the Mac)

Converting artwork into a PostScript font just became easier with this replacement upgrade for KeyMaster. The program allows you to create EPS images from object-oriented PICT or PICT2 graphics, as well as Aldus FreeHand and Adobe Illustrator images. Once converted, the graphic is accessed by means of a single key stroke in the new "font." Improvements over KeyMaster include support for 256 characters instead of 16 and support for images brought in from Bröderbund's TypeStyler (see *Verbum 3.1, 3.3*). \$179; \$20 if upgrading from KeyMaster.

Altsys Corp., 720 Ave. F., Suite 109, Plano, TX 75074, 214-424-4888.

TypeStyler 1.01 (for the Mac)

A serious drawback to the earlier version of TypeStyler (*Verbum 3.3*) was its lack of support for Adobe Type 1 typefaces. Upgrade 1.01 solves this problem. Bröderbund's product takes advantage of the recent release by Adobe Systems of its secret "hinting" that produces the high quality of Adobe typefaces in smaller sizes.

TypeStyler 1.01 can now customize, manipulate and create special effects for all major font manufacturers' products. Special effects include adding perspective, shadows, shades, inlines and outlines, patterns and colors. Characters can be filled with 256 colors, up to 64 shades of gray and 126 editable patterns. Ten Agfa Compugraphic typefaces already converted into TypeStyler SmoothFonts are included with the program. The program can import PICT, EPS and MacPaint files. It can export its files in the same formats and in Adobe Illustrator 88 format. It works by converting fonts into graphic images using its SmoothFont technology. \$199.95 new; free to upgrading customers. Bröderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101, 415-492-3200.

Evolution (for the Mac)

Evolution is a font utility that converts Type 3 fonts created with Altsys Corp.'s Fontographer into Type 1 fonts. This includes such fonts as those from Image Club itself and other font manufacturers. The program makes the fonts usable with Adobe Type Manager, and hence usable with non-Postscript printers. The program also works in reverse, converting Type 3 fonts to Type 1. With this latter transformation these fonts can be included in output through Freedom of Press or MacRip PostScript conversion drivers, whose older versions don't accept Type 1 fonts. \$99. Image Club Graphics, Inc., 1902 11th Street S.E., Suite 5, Calgary, Alberta T2G 3G2, Canada, 403-262-8008.

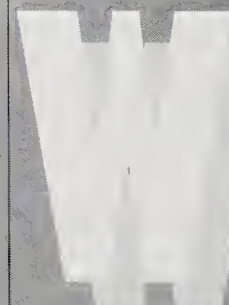
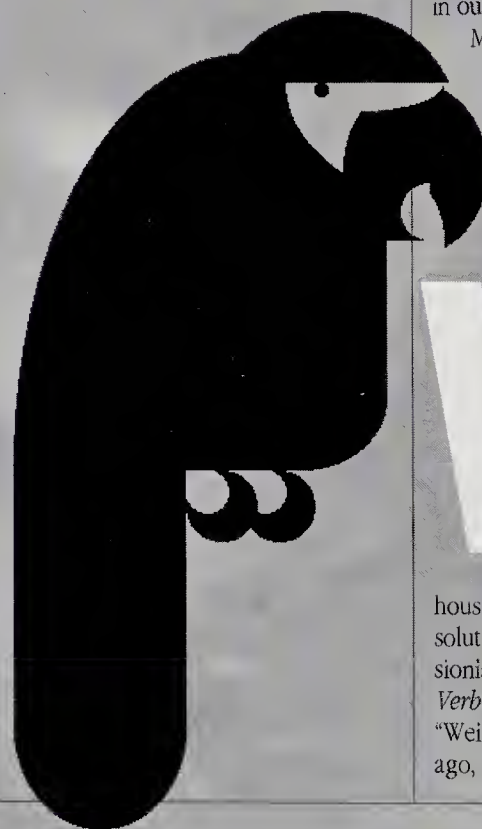
Word Ware

Expressionist

2.0 (for the Mac)

Typesetting math equations is always a bottleneck for those of us who work in type

houses. One of the best desktop solutions for this problem is Expressionist 2.0 (for another see MathType in *Verbum 3.1*). It has evolved from its "Weinberg" beta version of a few years ago, into a powerful math equation



editor. The software takes care of the mechanics involved — the subscripts, fractions, and signs — while the user fills the blanks with the numbers. Expressionist files can be exported and pasted into other programs as PICT files, or translated into Microsoft Word and other formats. Unfortunately, it can't directly generate an EPS file. The documentation is quite good. \$129.95 new, \$29.95 if upgrading from Version 1.0. Prescience Corp. 814 Castro St., Suite 60, San Francisco, CA 94114, 415-282-5864.

MacEnvelope (for the Mac)

Both Apple ImageWriters and LaserWriters will print envelopes with your address, return address, even your logo, using MacEnvelope. It will also drive Hewlett-Packard DeskJet and LaserJet Series II printers if used with MacPrint, another product from this

company. \$129. Insight Development Corp., 2200 Powell St., Suite 500, Emeryville, CA 94608, 415-652-4115.

Scriptwriter (for the Mac)

This powerful software combines a full-blown word processing program with functions customized for scriptwriting in a variety of situations: letters, outlines, treatments, formatted screenplays and dual-column scripts. It's ideal for professional scriptwriters. At least 1MB RAM is needed on your SE, SE/30 or Mac II. It interacts with Storyboarder. \$495. American Intelligence, P.O.B. 6980, Torrance, CA 90504, 213-527-7765.

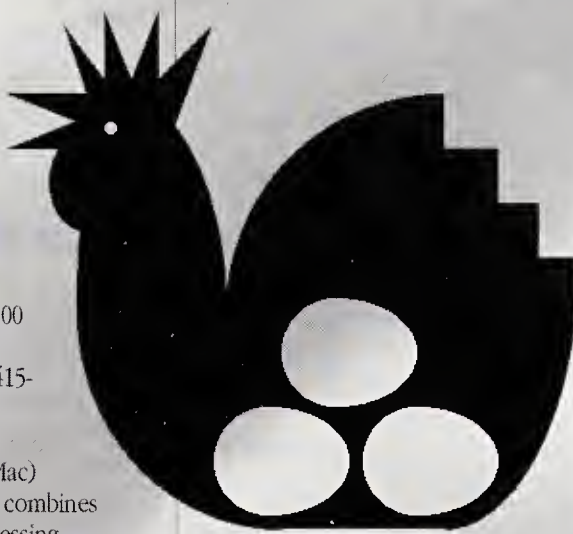
Storyboarder (for the Mac)

With this product you can produce storyboards for films, commercials or TV. Images can be mounted and shuffled on a spreadsheetlike master, edited, time-coded and played back. Graphic video, print montages and animatics are supported. Storyboards can be printed out with dialog or script notes, numbered, masked and formatted. \$495. American Intelligence, P.O.B. 6980, Torrance, CA 90504, 213-527-7765.

Wordbench

(for the Apple II and IBM)

A notetaker, outliner, and word processing program are all rolled into one software program at a price less than others charge for just a similar medium-level word processing function. Document formatting, editing, search and replace, and other features surpass those of competing programs such as Personal WordPerfect. IBM, \$189; Apple II, \$149. Addison-Wesley Publishing Co., Reading, MA 01867, 617-944-3700.



age Layout

DesignStudio

(for the Mac)

Rather than simply upgrade a strong, but underrated page layout product, Ready,Set,Go 4.5, Letraset is launching a new package, De-

signStudio. The product is an integral part of its new Studio line of graphic design wares. While it retains such useful features of RSG4.5 as the grids and guides for layout, it adds much needed pasteboard features made popular by the competition. Text and objects can be rotated in 0.1 degree increments. A polygon tool allows open or closed, yet editable, polygons that can be filled with patterns and color. Text wrapping can fit a wider variety of shapes. Automatic framing creates a border precisely matched to the shape. Customizable kerning and tracking tables stay with the document. Aesthetic rag control is now possible. What takes it beyond the current competition are its full-color capabilities. You can apply any color and percentage of tint to text and objects, using RGB, CMYK, HSB or The Pantone Color Matching System. It directly supports high-end prepress systems. \$795. Letraset 40 Eisenhower Dr., Paramus, NJ 07653, 201-845-6100.

PageMaker 3.0J (for IBM)

This Japanese version of the U.S. 3.0 version supports vertical text, Japanese line-breaking rules, and Japanese word processor imports. 3.0J will run on Japanese PCs supporting Windows 2.1.1. \$1100 (U.S.), Aldus Corp., 411 First Ave. So., Seattle, WA 98104-2871, 206-628-6594.

PageMaker 4.0 (for the Mac)

This newest version of the page layout leader is not just an incremental improvement over previous versions. It offers 75 new features, several of which correct important, long-standing deficiencies in the program. The new Story Editor allows text composition while in the program. Text entered in the Story Editor window automatically flows into the page layout. Other word processing tools, including a spell-

Grammatik IV & Grammatik Mac

(for the IBM and Mac)

An excellent product has gotten even better, and has spawned a Macintosh progeny. Although it had been announced, at press time we didn't have Grammatik Mac in hand. Watch for a review in a future *Verbum*. We did receive the new PC Grammatik IV in time. Grammatik III was already a powerful program (*Verbum 3.1*) for proofreading for grammar, style, usage, spelling and punctuation errors. Now, Grammatik IV has an improved user interface and added support for more word processors. It will now work with more than 30 word processing programs. With WordPerfect 5, Microsoft Word 5.0, WordStar 5.5 and several others, it can be accessed by a hot key. With the remainder it's still accessed from the DOS prompt. Grammatik IV has increased the number of writing styles you can choose as a benchmark to check your writing against to six: business, general, technical, fiction, informal and custom. Of particular interest to work groups required to follow a company style is the ability to customize Grammatik's rule base to fit your company's requirements. It's accessible and easy to follow, and it's a snap to make changes. Additional error-checking rules have been added to the rule base. Also announced were a British English version, and French and German products. The company has shown a strong commitment to improving its product over the years, a good omen for new Mac purchasers. \$99.95. Network version (5 users), \$189. Reference Software, 330 Townsend, Suite 123, San Francisco, CA 94107-9883, 415-541-0222.

checker, indexing capabilities and search-and-replace routines, are also included.

Typographic controls go beyond improving kerning or letterspacing, which they do, to allow type manipulation. Type can be rotated in 90 degree increments, condensed and stretched. PageMaker is now optimized for book or manual production by allowing longer files, up to 999 pages, finally drawing abreast of Ready,Set,Go in this respect. Image handling has also been improved. \$795, \$150 for 3.0 owners. Aldus 411 First Avenue So., Seattle, WA 98104-2871, 206-628-6594.

Quark 3.0 (for the Mac)

Version 3.0 changes the Quark XPress interface to include more icons and on-screen palette displays for easier access to, and manipulation of, the program's features. A new pasteboard provides a work area adjacent to the page. Text and graphics can both be rotated 360 degrees in increments of one-thousandth of a degree. Typographic controls, which the program has always been strong in, have been further improved. Additions include vertical text alignment, a wider range of font sizes, text runaround capabilities, dropped caps and more. Word processing features now include spell-checking, search-and-replace controls, and widow and orphan line control. More precise color trapping is also available. \$795, warranty owners upgrade for \$30, other owners upgrade for \$150. Quark, Inc., 300 S. Jackson, Suite 100, Denver, CO 80209, 303-934-2211.

Quark XTras (for the Mac)

Really three products in one package, XTras are meant to be add-ons to Version 2.12 of XPress, Quark's high-end page layout and typesetting software. Four-bit Apple gray-scanner support, color separation improvements and support for color scanners are among the features included. \$79.95. Quark, Inc., 300 S. Jackson, Suite 100, Denver, CO 80209, 303-934-2211.



Ventura Publisher 3.0 (for the IBM)

With release 3.0 Xerox is bundling modules such as the Professional Extension with the program, rather than as an add-on.

Versions that will run under both Windows 3.0 and OS/2 are also shipping, in addition to the GEM version that supports XT's and AT's. The GEM version doesn't add new features as much as fix many bugs of the earlier version. The Windows and OS/2 versions, however, present a radically different and easier user interface. \$895. Xerox Corp., 9745 Business Park Ave., San Diego, CA 92131, 800-822-8221.

ultiMedia and Hypertext HyperKRS (for the Mac)

An information search-and-retrieval HyperCard version of the company's KnowledgeSet

Retrieval System. The package includes HyperIndexer, a utility that indexes the disk or CD ROM to allow for subsequent searches and retrievals. \$195. KnowledgeSet Corp., 888 Villa Street, Suite 500, Mountain View, CA 94041, 415-968-9888.

Tutor-Tech Hypermedia Authoring System 2.6 (for the Apple II)

This hypermedia software upgrade runs on the Apple II series, allowing users to create interactive video presentations with a VCR using Apple's Video Overlay Card. \$195. Techware Corp., P.O.B. 151085, Altamonte Springs, FL 32715-1085, 407-695-9000.

olor Technology C-Cube CL550-10 and CL550-27 (for the Mac)

Color work, especially color prepress work, is difficult on desktop systems because of the huge amount of

memory these applications require. C-Cube Microsystems' new CL550-10 is a color-compression utility board using a VLSI (very large-scale integration) chip. A 10 MHz version is reported to compress color images up to 1/200 of their original size without loss of color information. A 25 MHz version can do the same thing for real-time color video. The chips will be available as OEM (original equipment manufacturer) purchases. We'll have to watch to see which color boards incorporate them in the future. C-Cube Microsystems, Inc., 399-A W. Trimble Road, San Jose, CA 95131, 408-944-6300.

Chromascript

We don't expect you'll rush out to buy this \$17,900 RIP for the Matrix line of film recorders. However, for those of us who need to output PostScript color slides, it's welcome news. No service bureau could directly output my 67-slide program of Adobe 88 color files in the summer of '89. By the summer of '90 our local service bureaus should have it. Call Agfa Compugraphic and find out who has the Chromascript RIP in your area. Agfa Compugraphic One Ramland Rd., Orangeburg, NY 10962, 914-365-0190.

Color Scanning Solutions (for the Mac)

If you need to scan color images into your Mac but can't afford a high-priced dedicated color scanner, you now have several choices. You can buy a gray-scale scanner with a color filter capability or add a color filter capability to your existing gray-scale scanner. Both types work on the principle of scanning in images on a gray-scale scanner, but through red, green, and blue filters. The color filter products may be good enough for your application and pocketbook. **Microtek's MSF-300Z** 24-bit flatbed color and grayscale scanner uses built-in RGB filters to scan in the color. The **Sharp Electronics Corp.'s JX-100** hand-

held color scanner also uses built-in filters. **Studiotechnics' ColorSet** is used with existing grayscale scanners. It's a combination of software and three color filters. You tape down your color image on your existing scanner. Then make three successive scanning passes of the image, placing a different color filter between your image and the scanner for each pass. All three products require a color Mac, a hard disk, and at least 2 MB of RAM. All three work best with 24- or 32-bit video cards, but work with 8-bit color systems running under 32-bit QuickDraw. All bundle editing software, but for best results you may want to import the images into more sophisticated imaging software. The \$995 JX-100 can scan only a 4 x 6-inch image and is reported to suffer from distortion problems, making it questionable for demanding prepress work. If you already have a grayscale scanner and your volume of color work doesn't justify a hardware upgrade, then the \$395 ColorSet is a sensible buy. But, if you're about to buy a scanner, the \$2695 MSF-300Z is a better buy than buying a cheaper grayscale scanner and ColorSet. The latter can't deliver the quality and convenience the former provides. A promised upgrade from Studiotechnics, offering better control of brightness and contrast, may make it a better buy in the future. Studiotechnics, Inc., Lakeview 436 Office Park, Bldg 2, 1031 S. Semoran Blvd., Winter Park, FL 32792, 407-657-0677. Sharp Electronics Corp., Sharp Plaza, Mahwah, NJ 07430-2135, 201-529-9500. Microtek Lab., Inc., 680 Knox St., Torrance, CA 90502, 213-321-2121.

ColorBoard 364 and ColorBoard 208 (for the Mac)

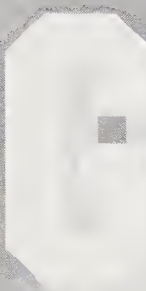
RasterOps has cut the cost of multimedia access with the introduction of two new products. ColorBoard 364 brings 24-bit color video capture in 30 frames per second real-time for an introductory price of \$1500. Its ColorBoard 208, for \$495, offers 8-bit color. The 364 will capture video from any source and display it in resizable windows on an Apple 13-inch color monitor or a compatible. Both products will be upgradable. The 208 can be upgraded with a 1 MB of 100-nanosecond video RAM, available from RasterOps at \$395, but also readily ob-

tainable from computer dealers. An external encoder box will be offered as an add-on for the ColorBoard 364. It will convert Mac images to NTSC format. In addition, the company has cut the cost of its 24-bit ColorBoard 264 from \$995 to \$795. SuperMac Technology has not yet announced whether it will lower the price of its competing product, the ColorCard/24, currently selling for \$999. RasterOps 2500 Walsh Ave., Santa Clara, CA 95051 408-562-4065.

PrePrint (for the Mac and IBM)
PrePrint replaces Aldus Separator, which was scheduled to be shipped with the Color Extension. Grayscale and color TIFF images can be improved and separated, either by themselves, or within a page layout document that includes text. The software works with PageMaker Color Extension and other applications supporting the Open Prepress Interface (OPI) and Adobe color conventions. Once altered and prepared the files are output to a Linotronic or other PostScript device. If you specify the type of paper stock the final publication will be on, the program will automatically adjust the dot-gain compensation, ink coverage and gray component removal settings. All these settings can be overridden. \$495. Aldus Corp., 411 First Avenue South, Seattle, WA 98104-2871, 206-628-6594.

SpectreSeps PM (for the Mac)
This specialized program fills in a gap in PageMaker Color Extension. It produces spot color and full-process color separations of PageMaker

documents created with Color Extension. At \$295 it's a lot cheaper than the reported \$495 Aldus is expected to ask for PrePrint. All major file formats are supported. Pre-Press Technologies, Inc., 2441 Impala Dr., Carlsbad, CA 92008, 619-931-2695.



raphics **Canvas 2.1**

(for the Mac)
Four-color separation features are one of the new capabilities of this upgrade to Canvas. The new version can

now save graphics in EPS format and provides improved Bezier curve drawing. \$30 for upgrading customers. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122, 305-594-6965.

ColorIX VGA Paint 1.2 (for the IBM)
Unlike most paint programs for the PC, this one is tailored to take advantage of the high-resolution VGA color standard that is fast becoming the norm for IBM compatibles. Version 1.2 supports most image file formats and can import TARGA files. This full-featured program will run with only 384K of RAM, unusually compact for PC programs these days. One of several utilities included with the software is one that allows you to capture screens from programs such as Symphony, Lotus 1-2-3, AutoCAD and others. \$199. RIX Softworks, Inc., 18552 MacArthur Blvd., Suite 200, Irvine, CA 92715, 714-476-8266.

Designer/PM (for the IBM with OS/2)
Micrografx's popular Designer 2.0 is now shipping for IBM PC compatibles running OS/2 Presentation Manager. Under OS/2, Designer/PM uses OS/2's outline fonts, multitasking and extended memory, as well as maintaining all the features of its Windows version. A 286- or 386-compatible, 4 MB of RAM, a hard disk, a mouse, an EGA or VGA card, a graphics monitor and OS/2 PM version 1.2 are required. \$695 new; \$99 upgrade for register owners of 2.0 Micrografx, 1303 Arapaho, Richardson, TX 75081, 214-234-1769, 800-272-3729.

GEM Artline
(for the IBM PC/XT, PC/AT, PS2 series)
With tools for the PC graphics environment that rival their Macintosh equivalents, GEM Artline is like a combination of Brøderbund's TypeStyler and a drawing program. Artline supports a wide range of monitors and both PostScript and non-PostScript printers. Manipulate either text fonts or graphics with a variety of tools for special effects, including patterning, coloring, mirroring, angling, scaling and more. It accepts scanned images in PCX, TIFF and IMG formats, and lets you trace the image to create an object-oriented drawing. Draw from scratch using its extensive tools, or use the library of clip art. It's completely compatible with Ventura Publisher, PageMaker and other programs using either the .EPS or .GEM formats. Installation took no more than 5 minutes on my 386-PC compatible, fast for an IBM product. The documentation provides clear, step-by-step instructions. \$495. Digital Research, Inc., Box DRI, 70 Garden Ct., Monterey, CA 93942, 800-443-4200.

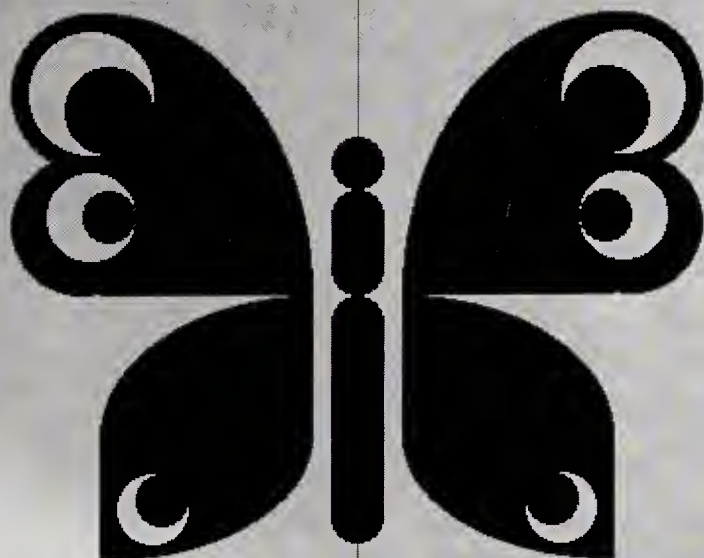
The Graphics Link Plus+ 2.0
(for the IBM and Mac)
No matter what operating system our writers use, we can always capture and transfer the text to our own system with one of three text-conversion programs. Uniform PC lets me reconfigure IBM PC disk drives into thinking they are Kaypro IV CPM or other drives. Blueberry Software then lets me do global search-and-replace functions to clean up the translated files. Between the Mac and PC I rely on

MacLink for flawless translations. But only recently have reasonably priced utilities for translating graphics from one format to another, and from the Mac to the IBM, emerged. One of them is The Graphics Link Plus+. Previously shareware, this program has been enhanced and is now sold commercially. It supports conversions of 17 bitmapped formats into another 18 formats, including PICT, TIFF, EPS, WPP and MacPaint. Color graphics can be converted to black-and-white or grayscale. If you work with other people's file formats, this is a good utility to add to your collection. \$149 new; \$40 upgrade for registered owners. HSC Software, 1661 Lincoln Blvd., Santa Monica, CA 90404, 213-392-8441.

QuickTrace (for the IBM)
Three versions of this tracing program exist for three different kinds of applications. Low-resolution scanned bitmap images are converted into high-resolution vector line drawings that can be manipulated and integrated into leading IBM PC programs. Each version converts the images into the graphics format appropriate for that program, including EPS for desktop publishing programs. \$245 for DTP; \$245 for Lotus Freelance Plus; \$295 for AutoCAD. Mitsubishi International Corp., Technology Affairs Dept. 520 Madison Ave., New York, NY 10022, 212-605-2339.

Streamline for the IBM with Windows (for the IBM)
In *Verbum 3.1* we reported on Adobe's Streamline for the Mac, a program for tracing scanned or painted images that produces vector graphic outlines of the image. Streamline goes way beyond other programs in its ability to outline images for future manipulation. Now it's available for IBM compatibles that can run Windows/286 or /386 with 1 MB of memory. \$399. Adobe Systems, Inc., 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039-7900, 415-961-4400, 800-344-8335.

VideoPaint (for the Mac)
VideoPaint is an 8-bit color and enhanced version of Aba Software Inc.'s GraphistPaint. Olduvai acquired the rights to the program when Aba went out of business. VideoPaint gives Olduvai a solid platform for future



development, given the advanced features the software brings to the user. The program has extensive imaging tools, including stencil and masking tools, color separation capabilities, 3D wire-frame object creation, distortion and other tools. Adjustable lighting and shading effects are among 40+ special effects features. Most notable may be the program's open architecture. This lets developers add their own special effects and drivers for output and input devices. It will import and export the major file formats, including TIFF, PICT and EPS. \$495; \$105 for registered owners of GraphistPaint. Olduvai Corp., 7520 Red Road, Suite A, South Miami, FL 33143, 305-665-4665.

lip Art

DigitArt (for the Mac)

Five new categories of volumes in this series include: Office & Education, Silhouettes, Design Backgrounds, Celebrity Caricatures and Universal

Symbols. \$99 per volume. Image Club Graphics, Inc., 1902 11th St. SE, Suite 5, Calgary, Alberta, Canada T2G 3G5, 403-262-8008.

Imagecells (for the IBM)

This library offers over 600 textures and 300 environmental objects (building materials, landscape textures, fixtures and so on) in 16-bit TARGA file format. All can be used with the company's Lumena and Crystal 3D graphics software packages. \$495. Time Arts, 3436 Mendocino Ave., Santa Rosa, CA 95403, 707-576-7722.

Photo Gallery (for the Mac)

This CD-ROM collection includes more than 1500 scanned TIFF format photos for easy inclusion in illustration and page-makeup programs. \$299. NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719, 508-264-8000.

PicturePaks (for the IBM and Mac)

Each PicturePak business clip art edition has 180 images in two file formats each: a draw file and a paint file. PC files include PCX paint files and CGM draw (vector) files. Mac files are in MacDraw II format and MacPaint

format. All are accessible to most major graphics packages. Five editions are available. Executive and Management, Finance and Administration, Sales and Marketing, Federal Government, and State and Local Government. Picture Paks for VideoShow include 60 or more animated pictures per pak for on-screen presentations and a nonanimated version for high-resolution slides, overheads and printouts. A selection of 19 different color printer backgrounds is available. Four editions include: Eye Openers (Business and Professional images), Technology (PC-oriented graphics), Business World, and Maps. PicturePak clip art, \$145 each edition, either computer; PicturePak for VideoShow, \$125 each edition, either computer. Marketing Graphics Inc., 4401 Dominion Blvd., Suite 210, Glen Allen, VA 23060, 804-747-6991.

The Right Images **(Vol. 1, Photoclip Collection)**

(for the Mac with CD-ROM)

This collection of color photographic images includes 103 images of Stars, Galaxies, the Earth, Planets, Shuttle Launches and Landings, and more. Each comes in a PICT2 format, but in three versions: 8-bit gray, 8-bit color and 24-bit color, all on CD-ROM. \$249.95 for Vol. 1. TSUNAMI Press, 275 Route 18, East Brunswick, NJ 08816, 800-448-9815, 201-613-0509.



JACK DAVIS

canners

Abaton Scanner Upgrade

(for the Mac)

Abaton released an upgrade kit for its own 300/S scanner and the Apple Scanner that allows upgrading each

from 4- to 8-bit resolution. This in turn permits us to capture that much more information from our scanned images. The only fly in the ointment is that the controller board part of the kit requires installation by an Abaton dealer. On the plus side, for an extra \$100 on top of the \$695 price tag you can buy either ImageStudio (Letraset USA, \$495 retail) or Digital Darkroom (Silicon Beach Software, \$395 retail). Abaton Corp., 48431 Milmont Dr., Fremont, CA 94538, 415-683-2226.

Microtek MSF-300Z Color/Gray scanner for IBM PC-XT/AT and PS/2 (for the IBM)

Already available in the Mac world, this scanner comes in at \$2695 for the IBM, less than most scanners with a color capability. Microtek Lab, Inc., 680 Knox St., Torrance, CA 90502, 213-321-2121, ext. 207.

LS-3500 slide scanner (for the Mac)

Nikon's new LS-3500 scanner brings a choice to the market when it comes to scanning color slides into your Mac. Until now, to scan a high-resolution 24-bit color slide image into a Mac the product of choice was a Barneyscan Slide Scanner. While the LS-3500 at \$9995 costs a little more than the Barneyscan at \$9495, the former offers more features. Calibrating and focusing the slides being scanned is an automatic process with the LS-3500 and a time-consuming, manual one with the Barneyscan. Initial testing seems to indicate that the Nikon product picks up detail more accurately in its scanning. The LS-3500 requires a Mac II with at least 2 MB of RAM, a hard disk, and a GPIB (general-purpose interface bus). A 24-bit monitor isn't necessary, but it's recommended. \$9995. Nikon, Inc., 623 Stewart Ave., Garden City, NY 11530, 516-222-0200.

SnapGuide (for the Mac)

Make sure your ThunderScan or LightingScan scans straight with this plastic guide that snaps on a hand-held scanner. \$14.95. Thunderware, 21 Orinda Way, Orinda, CA 94563, 415-254-6581.

Image Editors

Cleopatra (for the IBM)

Multiple-document display, a wide variety of brushes, and image screening from 300 to 2400 dpi are featured in this grayscale image-editing program for PS/2s and IBM PCs. \$595. Pixie Imaging Systems,

10020 Prospect Ave., Suite B1, Santee, CA 92071, 800-962-1306, 619-562-0883.

Xerox Gray F/X (for the IBM)

Eight-bit image-processing with 256 levels of gray is combined with advanced editing features for halftone optimization. Gray F/X supports monochrome or grayscale TIFF, GEM IMG, HALO CUT, ZSoft PCX, and PostScript EPS files. Enhancement features include altering contrast, lightness and darkness, as well as special effects such as blur, charcoal, sharpen, filter and posterize. It requires a PC/AT or above, hard disk, 640K of RAM and a VGA card and display. \$345. Xerox Imaging Systems, Inc., Datacopy Kurzweil, 535 Oakmead Parkway, Sunnyvale, CA 94086-9649, 800-821-2898.

ImageStudio with Effects Modules (for the Mac)

The Effects Modules significantly enhance the already powerful ImageStudio. Images can be manipulated in new ways, such as by changing the level of opacity. Halftones can be previewed with different dot shapes. One special feature is the ability to select an



JACK DAVIS

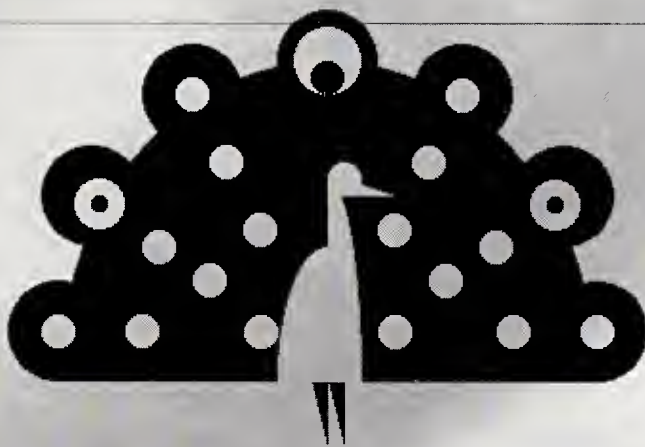
object on the screen and fine-tune it in a clipboard before integrating it back into the overall image in your design. \$495 for the whole package; upgrade free for customers who purchased ImageStudio after Aug. 15, 1989, and \$99 for those who purchased it before that date. Letraset, 40 Eisenhower Dr., Paramus, NJ 07653, 201-845-6100.

PC Paintbrush IV Plus (for the IBM)
For the price, this program is an excellent buy for IBM compatible owners. PC Paintbrush IV was already a strong paint program with a good selection of image rendering tools. The Plus version, however, is more than just an incremental upgrade. While the older version could work with only small scanned images, the new version uses virtual memory management to work with multimegabyte-size graphics, even on a 640K system. It will work with extended memory systems. One useful scanning tool is the ability to preview your scan in low-resolution and select out a part that needs high-resolution editing. Both PICT and TIFF formats are supported. DOS 3.0 or later, an EGA or preferably a VGA monitor, a hard drive and a mouse are recommended. \$199 new; \$50 for PC Paintbrush Plus owners; \$69 for PC Paintbrush IV users. ZSoft Corp., 450 Franklin Rd., #100, Marietta, GA 30067, 404-428-0008.

Alternative Input Devices

GRiDPAD portable (for the IBM)
This machine with handwriting recognition capabilities weighs 4.5 pounds and measures 9 x 12 x 1.5 inches. It

reads handwriting and verifies the input. The \$2370 system includes an 80386 10 MHz processor and a 20 MB hard disk drive, and it runs on an internal NiCad battery pack or an external power supply. An integral tethered pen is included. GRiD Systems Corp., 47211 Lake View Blvd., Fremont, CA 94538, 800-222-4743.



Lester, The Cordless Mouse (for the Mac)

If you're tired of hassling with your mouse's cord, yet don't like the trackball alternative, try this cordless mouse. You have a choice of modes, depending on the level of detail in your image. \$149.95. LightWave Technologies, Inc., Box 599, Mundelein, IL 60060, 708-362-6555.

isplay Options **ClearVue/GS** and **ClearVue/GS30** (for the Mac)

Both of these monitors for the Mac II and SE/30 families are grayscale devices offering 256 shades of gray and features such as Hardware Pan and Zoom. Display resolution is 1024 x 768 pixels, providing 72 dpi. Display modes include 1-, 2-, 4- and 8-bit. Each system consists of a 19-inch grayscale monitor, 8-bit display board, cabling and software. At \$2195 they are nicely positioned just above similar-sized monochromes, and hundreds lower than other grayscale systems. RasterOps, 10161 Bubbl Rd., Cupertino, CA 95014, 408-446-4090.

CT-II and CT/30 (for the Mac)

Eight-bit color systems for the Mac II and SE/30 respectively, both are based on the Ikegami Trinitron monitor and sell for \$3999. Generation X Technologies, 3350 Scott Rd., Bldg. 7, Santa Clara, CA 95054, 408-739-4570.

MacSync and MultiSync GS2A monitors (for the Mac)

NEC has customized its monitor line to include a series for the Mac II's Video Card. The \$239 MultiSync GS2A is a grayscale, analog monitor with a 14-inch nonglare screen and a tilt-swivel base for easy adjustments. Controls are up front, which we hope is a trend everybody will be following. A variety of MacSync color monitors start at \$699.

NEC Home Electronics (USA), Inc., 1255 Michael Dr., Wood Dell, IL 60191, 1-800-826-2255.

QuickColor and QuickCAD Graphics Engine (for the Mac)

Each of these screen accelerator cards speeds up the rate at which the Mac screen refreshes itself. This is especially important for two-page monitors with 32-bit screens. QuickCAD offers other features in addition to the increased speed of 6 mips (millions of instructions per second) that both share. Both sport reprogrammable microprocessors for future updates, important since Apple is expected to support QuickDraw acceleration. QuickColor, \$795; QuickCAD Graphics Engine, \$1495. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131, 408-434-0770.

RasterOps Calibrator (for the Mac)

This 19-inch monitor is self-calibrating and includes an 8-bit color graphics board, optical sensor and monitor. A 24-bit board is also available. 8-bit system, \$10,000; 24-bit system, \$13,000. RasterOps Corp., 1710 Fortune Dr., San Jose, CA 95131, 408-434-0770.

TPD/21 (for the Mac and IBM)

Radius has announced new 21-inch monitors for its line. The TPD/21 for the Mac SE, SE/30 and II line offers a resolution of 1152 x 882 pixels at 74 dpi for \$1795. In addition, you must buy either their monochrome TPD board for \$595, or their \$1895 Radius GS/C board for 256 gray levels. For the PC, Radius is offering their TPD/PC at \$795, which includes drivers for Windows and major applications. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131, 408-434-0770.

Output

Freedom of Press 2.1a (for the Mac SE/30, Mac IIs and IBM)

An earlier version saved my life in the fall of '89. This PostScript language converter outputs PostScript files on non-

Postscript printers and film recorders. With 67 Illustrator 88 color files to be output as slides, my company discovered that the PostScript RIPs for various film recorders hadn't shipped. Luckily, the University of California at San Diego's service bureau had bought Freedom of Press to allow PostScript graphics to be output on their LFR film recorder. Despite bugs and frustration with the cumbersome setup, we got high-quality color slides. Version 2.1a addresses this cumbersome setup process and makes the software a Chooser-level driver. The program can now use up to 8 MB of RAM for complex PostScript files. A Professional version supports high-end imaging devices, including large-format electrostatic plotters, continuous-tone inkjet printers, and high-resolution typesetters. Unfortunately, the company has chosen to include support for Adobe Type I fonts in this high-end version, but not in the 2.1a version. \$495 new; \$45 upgrade to registered owners. Professional, \$1495 plus extra for particular drivers. Custom Applications, Inc., 900 Technology Park Dr., Bldg 8, Billerica, MA 01821, 508-667-8585.

GoScript (for the IBM)

GoScript is a PostScript Language Interpreter in software, not a cartridge, for any IBM with 640K and a hard disk. It will enable most laser, inkjet and dot matrix printers to output PostScript text and graphics to the limit of their resolution. GoScript, unfortunately, doesn't let you print from within an application. Rather, you have to print to disk, exit the program and then run GoScript. GoScript will preview the PostScript conversion if you have either an EGA or a VGA monitor. \$195 package includes 29 fonts; \$395 package includes 51 fonts. LaserGo, Inc., 9369 Carroll Park Dr., Suite A, San Diego, CA 92121, 800-451-0088.



MacRIP 1.1 (for the Mac)

Formerly known as PostPrint, MacRIP 1.1 is a PostScript software interpreter similar to Freedom of Press. With it, users can print PostScript output, both text and graphics, on non-PostScript printers. Unlike Freedom of Press 2.1a, this package supports Adobe Type I fonts when run under Adobe Type Manager. The software comes with drivers for Hewlett-Packard and Apple printers and with 17 PostScript fonts equivalent to the LaserWriter standards. Other drivers go for \$50. It's a Chooser-level device. \$145 new; \$25 to upgrade. TeleType-setting Co., 474 Commonwealth Ave., Boston, MA 02215, 617-734-9700.

PacificPage/Personal Edition (for the Mac)

PostScript in a cartridge for the LaserJet IIP printer is the latest Pacific Data enhancement for the LaserJet Series II printers. With their cartridge and 2 MB of extra memory your LaserJet IIP will produce top-quality PostScript output. \$499 for the LaserJet IIP; \$695 for the LaserJet II. Pacific Data Products, 9125 Rehco Road, San Diego, CA 92121, 619-552-0880.

PixelScript (for the Amiga)

This software permits printing of PostScript files to a dot matrix printer. If an individual is into desktop publishing, then the new output to a dot matrix printer is outstanding (it has surpassed PageStream). Pixelations, Inc., P.O. Box 547, Northborough, MA 01532, 508-393-7866.

UltraScript PC Version 2.0 (for the IBM)

QMS has given us another PostScript clone to turn your non-PostScript LaserJet II and many other printers into PostScript devices. Unlike GoScript, also reviewed in this issue, UltraScript PC will let you print your PostScript output from within PageMaker, WordPerfect 5.0 and other programs. This software solution does carry an overhead, however. It requires a 286- or 386-CPU with 640K of the normal DOS memory and at least 800K of free extended memory. In making a comparison with a cartridge-based PostScript interpreter such as one of PacificPage's products, keep in mind

the cost of this extended memory. You can print without the extended memory, but it's slow and can't be done from within a program. UltraScript comes with its own font packages, but will also support Bitstream fonts when they're downloaded. UltraScript PC, \$195, includes 25 fonts; PC Plus, \$445, includes 47 fonts. QMS Inc., P.O. Box 58101, Santa Clara, CA 95052-8101, 800-635-3997.

TurboPS/400 (for the Mac and IBM)

By adding a 20 MHz Intel RISC graphics processor and an 80186 I/O processor to its PostScript controller, NewGen Systems has produced a very fast laser printer. The manufacturer claims that the average PostScript file is processed 15 times faster than other PostScript printers can do it. And your PostScript files, whether from a Mac or an IBM-compatible, are printed at 400 dpi. An upgrade will even produce 800 x 400-dpi resolution. High-volume shops and those with complex graphics will appreciate the speed. \$6495 includes 3 MB of RAM, expandable to 5 MB. Hi-res upgrade, \$1995 additional. NewGen Systems Corp., 17580 Newhope St., Fountain Valley, CA 92708, 714-641-8900.

Happy Blaster (for the Mac)

This board makes the HP LaserJet IIP into a PostScript printer. Since "real" PostScript printers cost \$3000 and up, this can be attractive if you already own a LaserJet. Of course you'll need the 1 MB RAM option for the printer (\$500). If you don't yet own a LaserJet, consider that they run under \$1000 discounted. \$595 Pacific Rim Data Sciences, Inc., 47307 Rancho Higuera, Fremont, CA 94539, 415-651-7935.

JetWriter (for the Mac)

This product combines an interface board from Extended Systems and Insight's MacPrint driver to allow a Mac user to output to the low-cost HP LaserJet IIP printer. An extra bonus is compatibility with Adobe Type Manager, giving the printer access to Type 1 fonts. \$345. Insight Development Corp. 2200 Powell St., Suite 500, Emeryville, CA 94608, 415-652-4115.

LaserJet Series IIP

(for the Mac and IBM)

HP's newest 300 dpi introduction to its laser printer family is being heavily discounted and may be found for close to \$1000. One trade-off for the lower price is a low, four pages per minute print speed, half the industry standard. For Macintosh users, Insight Development Corp. (see JetWriter) brought out a driver and cable kit to connect the new printer to the Mac for \$149.95. \$1495. Hewlett-Packard, P.O. Box 60008, Sunnyvale, CA 94008, 800-538-8787.

PLP II (for the Mac)

Mac owners who can't yet justify a PostScript printer have another choice at the lower end of the market with this entry. Using LED technology, the printer outputs at four pages per minute. It comes with six Bitstream outline fonts and other font packages are available. The MacFontware converter (also from Bitstream) allows users to convert other Bitstream fonts into this machine's format. At \$1399 it's \$300 cheaper than their earlier Personal LaserPrinter. \$239 for each additional font package, \$29 for MacFontware Converter; legal-size paper tray for \$89. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154, 617-890-0880.

WriteMove (for the Mac)

An amazingly light (3 lbs.) portable ink-jet printer. Although the resolution is only 192-dpi, who's going to lug their LaserWriter Plus along on trips? Uses 8½ x 11-inch sheets or fanfold paper. \$579. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154, 800-422-7777.

Colossal PostScript (for the Mac)

Now you can print out color PostScript files on plain paper or 4mm film in sizes up to 42 inches wide and up to 25 feet long. The product that does this, and without tiling, is a PostScript-clone plotter controller now being shipped to service bureaus. It works with Freedom of Press and Versatec's 400 dpi plotter. This service is currently available from the ReproCAD Network, a group of 59 blueprint companies. ReproCAD Network, 3470 Mt. Diablo Blvd., Suite A-150, Lafayette, CA 94549, 415-283-7860, 800-395-7523.

4CAST (for the Mac)

An exciting new continuous-tone color printer that uses special dyes and paper to produce an image that puts thermal wax printers to shame. There is no color banding and, though they claim only 300 dpi, the continuous tones give an illusion of much higher resolution. Page size is 11 x 17 inches. (Kodak and Canon have demonstrated similar printers at recent trade shows.) This is the color comp technology we've been waiting for. Call your service bureau to check for output availability. \$75,000 Du Pont, 1007 Market St., Wilmington, DE 19898, 800-441-7515

ideo

VideoQuill

(for the Mac II)

This character-generation program made specifically for desktop video applications, comes with nine outline fonts with advanced

antialias characteristics, with a package of 47 additional fonts as an option. They can be stretched, resized, distorted and rotated. Data Translation says they'll be compatible with Apple's new Royal fonts. 24-bit color PICT or TIFF images can be used as either backgrounds or fills for VideoQuill's fonts. Text with graduated color backgrounds or fills can also be created with the software. Drop shadows, kerning, variable type densities and drawing and layout tools are included. \$495. Data Translation, Inc., 100 Locke Dr., Marlboro, MA 01752, 508-481-3700.

resentation Ware 480C PC Viewer

(for the IBM)

An LCD overhead projection panel, the 480C PC Viewer offers up to eight colors when placed atop an overhead projector. It

plugs into the VGA port on your PC and produces a 640 x 480-pixel resolution. The three-layers of LCD panels, red, blue and green, reportedly produce truer colors than other products on the market. Whether in the boardroom or at a trade show, though, you must have both the projection unit and your PC to run your show. \$4495. In Focus Systems, 7649 S.W. Mohawk St., Tualatin, OR 97062, 800-327-7231, 503-629-4968.

Universal Bravo Computer Slide Maker

(for the Mac SE/30s, Mac IIs and IBM)

This is a far cry from the Polaroid Palette we paired with our IBM PC many moons ago. Then it was unique, a graphics output the Mac didn't have. The resolution was low, IBM CGA, practically horse-and-buggy era compared with this new product. Bravo supports resolutions up to 4000 lines, with 16.8 million colors. The price is a far cry from those days too. We paid about \$1700 for the old Pal-

ette. That's progress for you. \$5995. Polaroid Corp., 575 Technology Square, Cambridge, MA 02139, 617-577-2000, 800-225-1618.

ViewFrame RGB (for the Mac)

Sixteen colors at a resolution of 640 x 480 pixels is the combination this LCD panel offers. The unit offers a wide variety of controls for focusing, adjustment and color intensity. Cabling for connecting to all Mac models is included. \$3995. nVIEW Corp., 11835 Canon Blvd., Newport News, VA 23603, 804-873-1354.

ublications on Paper

Learning PostScript: A Visual Approach

by Ross Smith,
PostScript editor for *PC Magazine*, is oriented to the nonprogrammer.

It begins with a simple three-line program, and then illustrates each new concept with a short program listing and a facing-page illustration. A good approach for those who want to get into PostScript but are intimidated by the idea of learning programming. \$22.95, ISBN 0-938151-12-5. Peachpit Press, Inc., 1085 Keith Ave., Berkeley, CA 94708, 415-527-8555.

Canned Art: Clip Art for the Macintosh

More than 15,000 clip art images from 35 publishers are catalogued in this 800-page, well-indexed book, which also includes tips and techniques for using clip art and coupons for \$1000 worth of free and discounted clip art on disk. \$29.95. Peachpit Press, 1085 Keith Ave., Berkeley, CA 94708, 415-527-8555.

Real World PageMaker 4: Industrial Strength Techniques (Macintosh Edition)

by Olav Martin Kvern and Stephen Roth is the best book about using PageMaker that we've ever seen. It's filled with information that doesn't make it to the design-your-own-newsletter PageMaker books we're used to seeing. The two authors have drawn not only from their own very extensive experience, but also from the myriad tips and tricks published over the last five years in Mac and desktop publishing magazines. Chapters include "System," "Making PageMaker Mind," "Words," "Pictures," "Printing," "Color" and "Workgroup Publishing." All provide in-depth and up-to-date information. For example, the "Words" chapter includes explanations of units of measure on PageMaker pages; creating, placing, linking, replacing and rotating text; formatting characters and para-

graphs (including how to fill in gaps in PageMaker's widow control); leading and working with a leading grid; horizontal spacing and alignment; working with tabs; and fractions and drop caps, among other topics. The goal of the authors is to "make you to PageMaker what Godzilla was to Tokyo — a raging, inexorable thunder lizard of a page maker, letting nothing stand in your path." This is not a volume for the faint-hearted, if you use PageMaker, you need this book. \$24.95. Bantam Electronic Publishing, 666 Fifth Avenue, New York, NY 10103, 800-223-6834.

ilities

Virtual 2.0

(for the Mac)

If 8 MB of RAM isn't enough for you on your Mac II, Virtual 2.0 offers a solution. The software will make your Mac think and

operate as though it has 14 MB of RAM at its disposal. Virtual memory management, as it's called, involves setting aside a section of your hard disk as though it were RAM, allowing you to work with graphics and files that require more than the Mac II's 8 MB limit. The software requires a special chip, called a paged-memory management unit (PMMU). \$199 for the software alone, \$275 if combined with a PMMU chip. Connexitix Corp., 125 Constitution Dr., Menlo Park, CA 94025, 415-324-0727.

After Dark 1.1 (for the Mac)

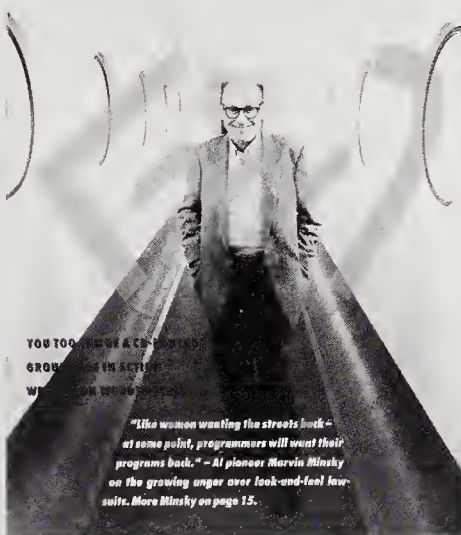
If you're worried about "burning-in" the phosphor on your screen when it's on and you're not using it, you need a screen saver. After Dark is probably the most sophisticated one on the market. Once installed in your system file, a 1-minute operation, it gives you a choice of a dozen screen effects. You control how much time must pass before the effect kicks in. A handy feature is two small icons for manually turning it on or off if you don't want it to be automatic. A message module lets you create a message such as "Back at 1 p.m." or "Touch this computer and die" that will come on the screen instead of one of the graphic savers. You can scan in your company's logo as the

Electric Word

This international English-language magazine from the Netherlands is irreverent, iconoclastic and exciting. It does for the electronic word what *Verbum* does for graphics, it pushes the limits and lets you know about others doing the same. We know of no U.S. equivalent of this magazine. *Electric Word*, formerly *Language Technology*, started as a magazine for language translators and language translation technology. It later broadened to include all manner of electronic word processing, hence the name change. One focus is still on foreign language translation, making it a must for companies operating internationally, especially in the new pan-European market of the 1990s. \$50 U.S. for individuals, \$95 U.S. for corporations, institutions. Electric Word, Emmalaan 21, 1075 AT Amsterdam, the Netherlands 31-20-664-6551.

ELECTRIC WORD

THE MAGAZINE OF WORD-MADE COMPUTING



(Formerly LANGUAGE TECHNOLOGY) #11 January/February 1990 \$11.95 US\$10

screen saver. The manual provides instructions and code for programmers who want to create their own screen savers. \$39.95. Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709, 415-540-5535.

Antivirus programs (for the Mac)

Antivirus manufacturers have turned out a new crop of upgrades to combat nVIR/f, another mutation of the nVIR virus currently circulating. Products that will combat this and other versions of the virus include: Disinfectant 1.6 (free on bulletin boards); Virex, Version 2.4 (\$99.95, HJC Software, Inc., Durham, NC); SAM, Version 1.5 (\$99.95, Symantec Corp., Cupertino, CA). Two programs that already protected against the virus are AntiToxin (\$99, Mainstay, Agoura Hills, CA) and VirusDetective DA (shareware, bulletin boards).

DiskTop 4.0 (for the Mac)

DiskTop extends the file management capabilities of the Finder. Microlytics GOfar 2.0 is bundled with this package to allow you to find, list, delete, rename, copy, move, size, launch or set the attributes of files on any disk from the Apple menu, a pop-up menu or a hot-key accessible window. \$99.95. CE Software, 1854 Fuller Rd., P.O. Box 65580, West Des Moines, IA 50265, 515-224-1995.

PrintCache (for the IBM)

This is the successor to the company's LaserTorq, one of the best print spoolers for Hewlett-Packard's LaserJet printers. It takes the file off your screen, temporarily stores it on your hard disk, and prints it in the background, freeing up your screen and keyboard for another job. PrintCache goes beyond mere print spooling by obviating the need for costly memory upgrades of the HP LaserJet IIP, needed to print a full page of 300 dpi graphics. It compresses a full page of graphics into the 512K of memory that's standard with the LaserJet II series. \$149. LaserTools Corp., 5900 Hollis St., Suite G, Emeryville, CA 94608, 415-420-8777.



QuickShot

(for the Mac with System 6.0)

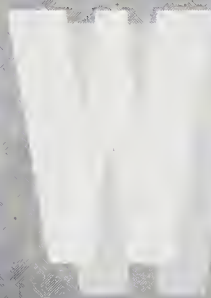
A screen-capture utility that supports 24-bit color and allows you to save part or all of your screen. Captures can be saved in PICT, PICT2 and MacPaint formats. It'll even flag each with a time-date stamp if you like. Any screen size is supported. \$89. Boston Companies, Inc., 15 Wake Robin Rd., Sudbury, MA 01776, 508-443-0075.

The Complete Undelete (for the Mac)

Do you regret deleting that file an hour ago? Install The Complete Undelete as part of your Control Panel and you'll have a fast way to restore deleted files. \$49.95. 1stAid Software, 40 Radnor Rd., Boston, MA 02136, 617-783-7118.

PostShow (for the Mac)

If you program in PostScript, this utility may be for you. Write your PostScript code in one window and the program interprets and displays the images it defines in another window. It will output to either a PostScript or a non-PostScript printer. It can also display, and allow you to debug, files generated by other PostScript programs. \$224.95, includes 13 scalable, rotatable fonts. Lincoln & Co., 45 Winthrop St., Concord, MA 01742, 508-369-1441.



Worldware Voyager, The Interactive Desktop Planetarium 1.2

(for the Mac)

Just when you'd swear you'd seen it all, along comes a specialized product like Voyager. For the amateur astronomer this program delivers the night sky to your Mac screen. Many different views of the

stars are available, including a Star Atlas, Local (major U.S. cities are supported) and Celestial views. Different coordinate views and readouts, eclipses, occultations, axes of rotation and more features are included. A bargain for the enthusiast. \$124.50. \$30 for 1.0 owners upgrading. Carina Software, 830 Williams St., San Leandro, CA 94577, 415-352-7328.

LinguaROM (for the Mac)

A CD ROM with sound, containing the entire collection of Hyperglot Language Tutor stacks. Lessons are included for Russian, Spanish, French, German and Kanji. For each language, there are extensive digitized sounds, grammar exercises, vocabulary drill, and verb conjugation exercises, as well as examples recorded by native speakers, with translations provided. \$499 (Lessons are also available on disk as HyperCard stacks for \$19.95 to \$129.95). Gazelle Technologies, 531 Stevens Ave., Suite B, Solana Beach, CA 92075, 800-843-9497.

Deals

Latest & Greatest (for the Mac)

Unique distribution scheme that bundles groups of software packages and sells them at substantial discount to "key

decision makers and influencers" (such as consultants, trainers, buyers, resellers). The Presentations/Multimedia collection, for example, includes MacroMind Director, Silicon Beach SuperCard & Super3D, Aldus Persuasion, Paracomp Swivel 3D, and Electronic Arts Studio/1 & Studio 8. Normally, these retail for \$2924 total. Yours for only: \$799. Latest & Greatest 483 E. Main St., Suite 221, Grass Valley, CA 95945, 916-477-2787.

Ecodisc

(for the Mac)

The Ecodisc, a CD ROM produced by the BBC Interactive Television Unit, is a simulation of a nature reserve, in which the user can explore and experiment. Although it's aimed mainly at students aged 14 through 18 studying ecology, it provides an ideal opportunity for an individual or small groups to do some problem solving and exploration. After walking around the reserve (or flying above it in a helicopter) in summer and winter, observing and collecting information on species, consulting the views of experts, viewing species data projections for up to 50 years in the future and managing the reserve, the user can make a presentation on the Mac, a slideshow of pictures and text collected or created during the visit to the reserve. Ecodisc is a multilingual presentation (in nine languages). \$195, ESM, Duke Street, Wisbech, Cambs, PE132AE, England, 011-44-945-63441. For information in the United States, phone Educorp at 619-259-0255.



the CONTINUING ADVENTURES of AMERICA'S FAVORITE HIPPIE HACKERS!

by MIKE SWARTZBECK

...the move comes three months after an independent evaluation committee appointed by the company's directors charged that management... "perpetrated a massive fraud," even shipping bricks as disk drives...

—news item in computer trade paper, 1/90



38 MINUTES LATER -



Look and Feel, from page 7 have called for photojournalists to adhere strictly to "reporting" the truth in their pictures — not to set up photos or manipulate them once taken. This kind of responsibility is certainly an important contribution to the ethics of modern photojournalism, but we have to realize that, copyright law or no, control of the photo is no longer exclusively in the hands of the photographer. Perhaps another responsibility of photojournalists (and word journalists alike) is to make the public aware of what's possible — and being done — in seamless image manipulation, to educate about the processes that produce the images that influence our lives through everything from advertising to the news, to bridge the gap between the present and the time in the near future when digital manipulation of photos will be available to

(and thus understood by) "everyone." At worst, a general skepticism about photographic images that may result from such exploration and education is almost certainly preferable to the vulnerability that comes from ignorance or the cynicism that can come from unaided discovery and disillusionment. At best, such education may result in a shared sense of wonder at the possibilities of modern technology rather than a sense of being digitally manipulated.

About a year ago, when I first started to ponder these issues, I asked a teenager I know whether (or how) he thought little kids would know that Roger Rabbit wasn't "real." He said they'd just figure it out, the way he had figured out about cartoons. And anyway their parents would explain it to them. Last week, as I admired a poster on the wall of his room (an

image created by computer photo-retouching artist Raphaela, with the Budweiser logo spanning three white-swimsuited models), I asked him if he knew that the Bud logo existed on the suits only in the poster, that it was added by an artist using a computer. "No —" he said, "it wasn't. You can tell it's part of the cloth." "It wasn't woven into the cloth," I said, "or even printed on it. Read that fine print at the bottom of the poster — maybe it tells how the image was created." But it didn't. 

Susan Heller, who did much of the research and synthesis for this column, is a San Diego-based freelance photographer and writer.

N eXT

in Verbum 4.2

BLEND0

Interactive Multimedia

Animation

Music

NeXT spotlight

HyperGallery

Welcome to *Verbumalia*. This mini-catalog offers back issues of *Verbum* and other products of interest to our readers. Let us know how you would like to see this section develop.

VERBUM BACK ISSUES

Collectible *Verbum* back issues are a record of the evolution of pc art and design. \$7.00 each, plus postage/handling. (Please note that some issues are out of print but are available in photocopy editions as indicated.)



1.0 Summer-Fall 1986 1000-copy edition Preview issue. Cover: illustration by Michael Gosney, *FullPaint* and *ThunderScan*; type and format designed by John Odam with *PageMaker*. Little writing and no advertising. Retrospective of publisher Gosney's *Macintosh Verbum* one-man show, and Macintosh art by French illustrator Jean Solé, Australian Malcolm Thain, nature artist Jim Pollock, Jim Hance, Jack Davis, Ed Roxburgh and Nathan Weedmark, plus excerpts from Michael Green's *Zen and the Art of the Macintosh*.

OUT OF PRINT. B&W photocopy edition available for \$12.00



1.1 Winter-Spring 1987 The first "real" *Verbum*, designed with *PageMaker* 1.2, black-and-white, 300 dpi laser output, beautifully printed on 70 lb. Sequoia Matte, 5000-copy edition. Cover:

masthead type treatment developed by Jack Davis with *MacDraw*, illustration, also by Jack, using *Pro3D* (Linotronic output). Avant-garde concept artist Paul Rutkovsky's redigitized illustrations, Mike Swartzbeck's trailblazing scanned image montage, David Brunn's digital photography. John Odam on *Fontographer*.



1.2 Summer 1987 Produced with *ReadySetGo!* 3.0, 1270 dpi Lino imagesetter output. Cover illustration by Jack Davis using *Realist* (pre-release of *ImageStudio*). "Amiga Video" on

the animated Amiga; "Painting as Spiritual Discipline" by Jack Davis on *Mac Calligraphy*; "Big Blue Art" by Mike Kelly on MS-DOS-based graphics; "Lino Seps" by Mike Saenz features the first publication of his Marvel Comics' *Iron Man* cover, the first PostScript sep. Australian Mac-artist Malcolm Thain.



1.3 Fall 1987 Produced using *PageMaker* 2.0, 10,000-copy run, the first to be sold on the newsstands. Cover: masthead type by Ed Roxburgh, photo-illustration by Jack

Davis, both developed with *ImageStudio*. April Greiman's "Pacific Wave" sculpture/exhibit. "Desktop Video," "Continuum" (a short story by Linnea Dayton), Dominique de Bar-donneche-Berglund, Swiss digital painter. Jack Davis on *ImageStudio*. "Creative Wave-forms" by Neal Fox focuses on music.



2.1 Winter/Spring 1988 The first color cover produced with *Illustrator* 88, by John Odam, digitally separated. Steve Hannaford's first "Against the Grain" column with critical technical/economic guidance. "Stackware Party" by Linnea Dayton, Lawrence Kaplan's "Hot-Tech" prints, "The Fine Art of Dot-Matrix Printing" by Nira, "PC 3D Showcase" by Jack Davis, "Color Output Options" by Erfert Nielson. John Odam's "First Contact" on *FreeHand*.



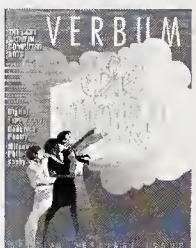
2.2 Summer 1988 *Verbum*'s first cover theme is "Fashion." Cover by Jack Davis, Lisa King and Michael Gosney combined scanned images with Adobe *Illustrator* elements (it won a magazine

industry award). "PC Fashion Design," Mel Ristau's "Electroglyphs" — iconic PostScript illustrations, Georgeanne Deen's "Rock and Rolling Amiga," "Sound Sampling Sensation" by Neal Fox and a how-to on shooting slides off your high-resolution monitor. **OUT OF PRINT.** B&W/color photocopy edition available for \$25.00



2.3 Fall 1988 "Space" concept issue cover by Tom Gould utilizing *Aldus FreeHand* 1.0. "Outer Space" gallery of cosmic visions by Ron Cobb and William Lombardo. Architectural

CADD survey with "Living Space" gallery. Regular ("Art Space") gallery features works by Bert Monroy, Ikeda Tomoyo and Dominique De Bar-donneche-Berglund, digitally separated with *PixelPaint* 2.0. Nicholas Mac Connell and Linnea Dayton travel to "Inner Space" with "Through the Silicon Looking Glass," an exploration of pcs as mind machines. John Odam on *PixelPaint*.



3.1 Winter 1989 "The Word" issue cover illustration by Tom Lewis and co. with *FreeHand*. Jack Davis' "Initial FX" on special effect initial caps, Mike Kelly's "Grammar and Style Checkers," a parody

on "Third-Generation Software for Writers" by Michael Rossman and the first *Verbum* interview with the intelligent program *Racter*. Gallery of image-laden poetry and poetic images. John Odam takes a second look at *Fontographer* and font design.



3.2 Spring 1989 "4D" issue cover by Jack Davis with *Pro-3D* and *Photo Finish*. "The Democratization of Computer Graphics" by Peter Sorensen, and "Down to the Desktop" by

Gregory MacNicol; "MIDI-Laser Performance Art — Cosmic Jam" by Nicholas Mac Connell; "The Teleomorphic Future" by Tad Williams; "HyperAnimation," by Elon Gasper, and "Interactive Artistry" with pioneering HyperCard projects. Interview with Todd Rundgren. "HyperGallery" features HyperCard art and the "4D Gallery" showcases animated visions. Like the previous two issues, 3.2 was produced with *PageMaker* 3.01 and includes many digital color separations.



3.3 Summer 1989 "Lifestyle" theme issue with cover designed by David Smith using Adobe *Illustrator* 88. Brenda Laurel's essay "On Dramatic Interaction," a definitive study of virtual reality and the dramatic arts; update on "Computer-Aided Fashion Design," Russel Sipe covers hot computer games; Mark Stephen Pierce writes on designing games in "Making Fun," columns cover telecom, health issues for pc users. Gallery emphasizes human forms.

ality and the dramatic arts; update on "Computer-Aided Fashion Design," Russel Sipe covers hot computer games; Mark Stephen Pierce writes on designing games in "Making Fun," columns cover telecom, health issues for pc users. Gallery emphasizes human forms.



3.4 Winter 1989 "Metaprint" issue focuses on output, with a Gallery that explores printing options. Cover by John Odam using *FreeHand* 2.0. "Separation Anxiety" by Steve

Hannaford, "Pixels at an Exhibition" by Brian Alexander studies the techniques for putting pc art on the wall; "Imagine Tokyo '89" recounts the latest major *Verbum*-produced exhibit with four pages of art and photos (all separated with the Scitex/Visionary system); "Architectural CAD on the Macintosh" by Phil Inje Chang; the first installment of David Traub's "Neomedia" describes the educational advantages of videodisc barcode readers; "First Contact" explores Photomac color separation/editing software.



Making Art on the Macintosh II by Michael Gosney and Linnea Dayton (Scott, Foresman and Company). Written by the editors of *Verbum*, this book is the comprehensive

reference for graphics on the Mac II. All major software and hardware products are covered. Processes are described and shown with extensive galleries of creative works from top artists and designers. The book features a 16-page color signature packed with inspiring art samples and informative captions. An invaluable guide for all Mac owners. 336 pages, 16 in 4-color, \$22.95

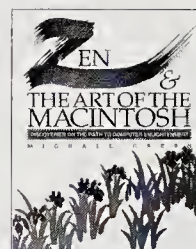
The *Verbum Electronic Art and Design Series*, published by M&T Books, represents the first graphic design instruction series on the new digital art tools. The first two titles, available in May, are described below. Other books in the series, available mid- to late-1990, include: *Bitmapped Illustration*, *Digital Typography*, *Digitized Imaging*, *3D Graphics*, *Animation and Presentations*, and *Hypermedia Design and Production*.



The Verbum Book of PostScript Illustration by Michael Gosney, Linnea Dayton and Janet Ashford (M&T Books). The first book in the *Verbum Electronic Art and Design Series* offers

comprehensive instruction on the use of leading PostScript illustration tools. Featuring projects by top illustrators, the book recounts each artist's step-by-step process, both technically and creatively. PostScript technology and key products are covered thoroughly, but the emphasis is on the creative process. The book includes color signatures and over 100 sample illustrations. 224 pages, 32 in 4-color, 8.5 x 11-inch \$29.95

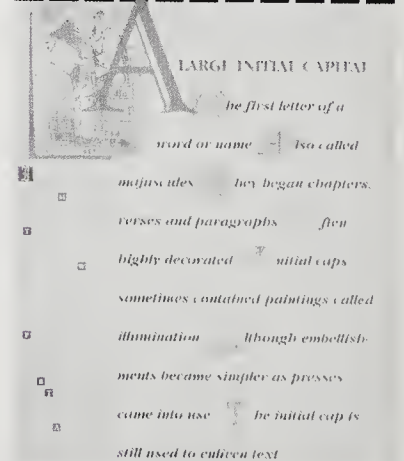
The Verbum Book of Electronic Page Design by Michael Gosney and Linnea Dayton (M&T Books). This volume explores desktop publishing design by top professionals, with the same format as *PostScript Illustration*. Over 100 sample designs. 224 pages, 32 in 4-color, 8.5 x 11-inch, \$29.95



Zen and the Art of the Macintosh by Michael Green. The landmark classic by one of the most influential of the original Mac pioneers. The book combines illustration, scanned

images, original prose, Zen philosophy and groundbreaking desktop design and production in an odyssey of discovery as the artist/writer recounts his experiences with the new tools and draws parallels in the process with spiritual growth. The final chapter gives detailed explanations of technical steps in creation of images and book pages. 256 pages, 8.5 x 11-inch, \$16.95

INITIALCAPS



Verbum Digital Type Poster

Verbum Digital Type Poster Designed by Jack Davis and Susan Merritt, this deluxe five-color, 17 x 22-inch poster showcases the variety of digital type effects possible on the Macintosh. It was produced on a Mac II with *PageMaker 3.0*, output on a Linotronic L-300 and printed on a 100 lb. coated sheet. The text explains the history of initial caps in publishing, and how each sample letter was created. A framable "illuminated manuscript" for every electronic design studio. Limited edition of 2000. Shipped in capped tube. \$10.00 postpaid. (Shown at bottom of page 54.)



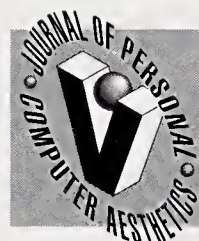
Verbum Stack 2.0 1990 version of the famous *Verbum Stack*, with usable start-up screens and icons, as well as tons of great bitmap art, animations, sounds, surprises. Shipped on two 800k floppies. \$12.00 postpaid.



Verbum Fonts by John Odam. Deco Tiles (including Deco Light and Deco Heavy) - is a complete custom PostScript font. This is the first font offered for sale from a series of original typefaces developed by *Verbum's* art director with *Fontographer* for use in the magazine. Three weights. \$60.00 postpaid.



back

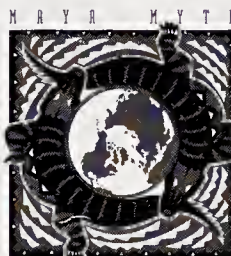


front emblem

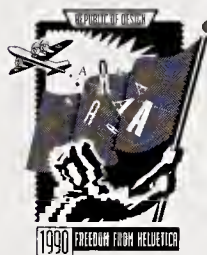
Verbum T-shirt 2.0 by Jack Davis

Illustrations, on back and front, developed by Jack Davis using Adobe Photoshop, Swivel 3D and TypeAlign on the Mac. The second *Verbum* t-shirt uses fun '50s images in a blatant promo for a provocative '90s art mag. Printed in red and black on both sides of heavy white 100% cotton shirts. Available in large or extra-large. \$17.00

Pop Laundry T-shirts by Don Baker
Illustrations (shirt fronts only) developed with *FreeHand* and *SuperPaint* on the Macintosh. Heavy white 100% cotton shirts.
Maya Myth (red, gold, black)
Things Get Weird (orange, pink, black)
X-Ray Eyes (green, yellow, black)
Available in large or extra-large. \$17.00



Industrial Strength T-shirts
by Glenn Mitsui
Illustrations (shirt fronts only) developed with *FreeHand* on the Macintosh. Red and black on heavy white 100% cotton shirts.
Freedom from Helvetica
Go Forth and Create
The Weight of Creativity
Available in large or extra-large. \$17.00



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Against the Grain, from page 21

extent of your catalog, and then they end up buying ITC Garamond." Parker's adage is that "it takes 2000 faces in a catalog to sell 200 of them."

Along the same lines, Carter used to battle with the bean counters at Linotype when they complained about maintaining the inventories of faces that almost no one bought. Printers will carry the whole collection, he explained. Sometimes having a face that's used once a year for one corporate Christmas card can mean that a printer gets a half million dollars worth of Helvetica work. As a joking counterproposal to cutting out faces, he offered to reduce the library by taking out all the x's and z's, since there wasn't much call for those letters.

Distorting Typefaces

While no type distributor has a problem with the proliferation of typefaces, there is some concern about the ease with which fonts can be altered, distorted and reshaped by programs like Letraset's FontStudio and Altsys's forthcoming Metamorphosis, as well as the more expensive Nimbus-Q technology from The Company. As Parker puts it, "It's now so easy to vary fonts at will: make the x-height bigger, shorten the serifs, add a swash."

Letraset's managing director Michelle Blank sees both the plusses and minuses. "It enables designers to very quickly put their stamp on a face. That's a positive step in getting people to use type in an artistic fashion. On the other hand, it could really hurt if the result falsifies the original intent of the font designer. We're worried about these things. We want FontStudio to be used intelligently."

Blank joked that there should be a warning box with artificial intelligence and aesthetic judgment. The message box would read, "Do you really want to do that to this beautiful typeface?" In the end, she admits, they have little control.

Carter puns that "I report all font distorting violations to the font police, deputy serifs, to make them uphold the law of the letter." He notes that "after 550 years of movable type, we now have mutable type." Realistically speaking, he realizes there's not

much he can do. "You have to take the bad with the good. I see people take my faces and put curlicues on them, but my hands are tied."


In a similar way, Level is dismayed about some of the distortions. "I'm something of a purist. I don't see the need for distortion and manipulation. But then again, I'm not an advertising typographer." He admits that "along with the terrible things, some good things have already been done." He sees no serious help from the copyright laws, though he's pushing for legislation that will protect the designer of new faces more thoroughly.

Continued Escalation

All parties agree that if you think we have a lot of fonts and variants now, just hold on. The average office user may not care beyond Times and Courier, but even in the office we're seeing some changes as memo writers discover Lucida and Stone Sans. And as even ads in the classifieds and Yellow Pages get more sophisticated with graphics and innovative font use, the growing competition can only increase the need for new faces.

To be sure, the increase in faces has its dangers. It's hard to make a totally hideous page with Times and Helvetica (though it's hard to make a beautiful one, too). But with Hobo, Copperplate Gothic, Peignot and Park Avenue in my type drawer, I can create as ugly a page as I like, no problem. On the other hand, it's also true that a skillful designer can choose from these riches to create a striking, attractive and readable advertisement or magazine page. I guess typography is like a lot of other skilled occupations. While anyone can mess around with carpentry tools in the basement and build a birdhouse, you hand the hammer over to a serious craftsman when you want to build a house fit to live in.

Flash from the Front

As this went to press, IBM added strong reinforcement to the PostScript camp by announcing broad-ranging support for Adobe's Type 1 fonts. With Royal (at this instant) still not on the field, the main battle of the font wars may be over before it starts. 

Steve Hannaford is a computer journalist and writer. He is a columnist for Step-By-Step Electronic Design and contributes regularly to MacWeek.

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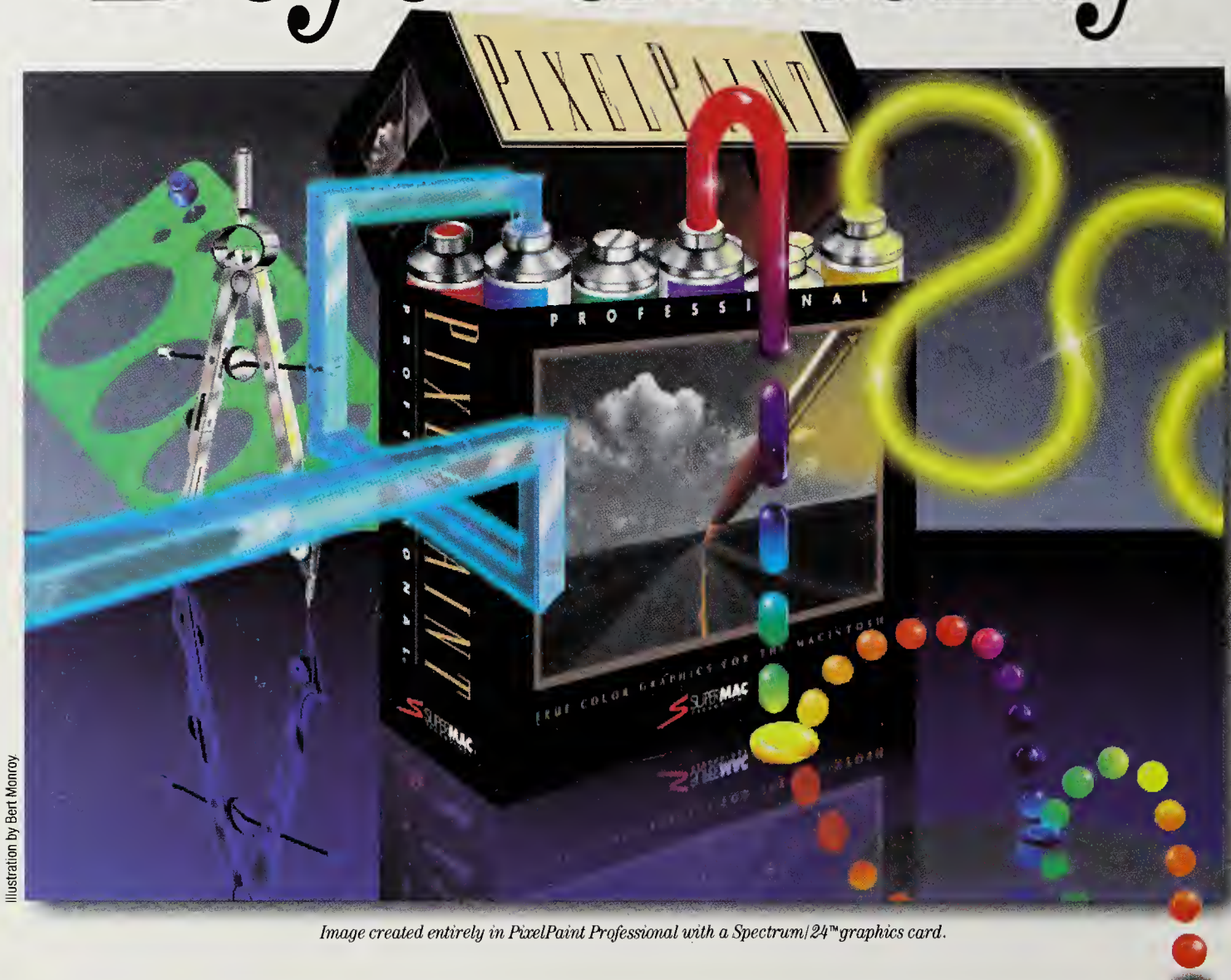


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